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# PCFormat

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# PCFormat

THE WORLD'S GREATEST PC MAGAZINE

# in your mag

#191 September 2006

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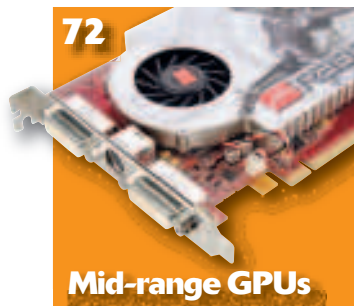




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# PCFormat

## Welcome

Overclocking has come of age. Formerly the sole domain of the insane, rich, or more usually the insanely rich, in the last couple of years it's become all but de rigueur for any relatively dedicated gamer. With a swift fiddle in the BIOS or a desktop app, a few more Megahertz there means a few more frames per second here, which in turn often leads to a few more frags right when it counts. And if pushing a component beyond its official limits

takes a few months off its life, so what? Chances are you'll have upgraded long, long before it flutters up to silicon heaven anyway.

What's more, it's becoming ever easier. Look at the entry-level Intel Core 2 Duo (the £150 E6300), which, with a bit of FSB nudging, totally trounces almost anything the competition currently has to offer. More astonishing yet, our own Mike Channell has managed to convince an £80 2.6GHz Pentium D up to an

incredible 4.1GHz – find out how on p38. Of course, you may have managed even grander overclocking accomplishments – do let us know on the forum or to [pcfmail@futurenet.co.uk](mailto:pcfmail@futurenet.co.uk).

Enjoy the issue,

**Adam Oxford, Editor**



**Alec Meer,  
Deputy Editor**

The grudging acknowledgement that sitting in the sun is quite nice and in front of a monitor less so led to extreme measures. An elaborate array of WiFi extenders runs through his house (necessary to combat Bath's signal-blocking pollution soup), stretching out to a jerry-rigged patio sunshade, beneath which lies a laptop. Thus he can honestly claim he is spending time outdoors, but as well as his skin he now also burns away his spare time on *World of Warcraft*.

**Achievement of the month** Seeing the British pedal car Grand Prix.



**Al Bickham,  
Technical Editor**

Upon returning from a brief tour of duty in Rangoon, Col. Bickerstaff arrived home just in time to enter the sponsored PCF *Quake IV* marathon. Never the most softly spoken of gentleman, he managed to insult the game and his colleagues, turning the very air a shade of ultramarine blue with a torrent of angered obscenity. Needless to say, we put him straight onto the next slow-boat and sent him back.

**Achievement of the month** Taking up the banjo.



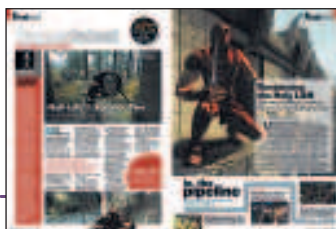
**James Carey,  
Games Editor**

Jim, on the other hand, entirely abandoned the virtual world for the real one this month, venturing outside to the waves of north Cornwall. There, he played football on a beach. He threw friends into a river. He also

convinced a stag-party of City investment banker-types to sign up to *Eve Online*. We expect the MMO's economy to rocket in the next few weeks...

**Achievement of the month**

Played *Quake 4* for 7.5 hours for Sport Relief. Got first blood. Came in last...



**Jeremy Laird,  
Technology Writer**

There are two things Laird enjoys more than any other – setting the hounds onto the peasants who queue outside his gates every morning, praying for him to coolly toss an unwanted Celeron or a GeForce 4 MX to them, and criticising sub-standard flat-panel monitors. The former he was denied, as we

scrabbled together every last piece of kit we could find to turn to slag in the name of overclock testing; the latter he indulges fully in over on p60. His great lust for Dell's fine widescreen range is public knowledge – can these upstarts hope to contend?

**Achievement of the month** Yet another Beemer off eBay.



# Frontend

## THE BEST OF THE MONTH IN COMPUTING

### Eye candy Golden silence

This custom-built, water-cooled rig from Quiet PC and MSI isn't available off the shelf, but you could always assemble it yourself from the parts list below (for about £1,200) and revel in silent, ice-cold majesty.

#### Under the hood

**CPU** Pentium D 820

**RAM** 2GB PC5400

**Storage** 250GB SATA II HDD, NEC DVD+-RW

**Graphics** 2 x NVIDIA

GeForce 7900GTX

**Case** Antec P180

**Cooling** Zalman RESERATOR1-Plus watercooling fan kit

**PSU** Nesteq 620W

[www.quietpc.co.uk](http://www.quietpc.co.uk)

[www.msi.com](http://www.msi.com)

### Push it

PCF's word-machine Mike Channell now whimpers like a kicked puppy whenever anyone waves a tube of thermal paste at him. Find out why, with the results of his epic overclocking undertaking, beginning on p38.

### Silence is golden

As well as burning up energy, a power PC makes a helluva racket and pumps out enough heat to melt a slug at 10 paces. Pick the best cooling system for your rig from our test on p44, then follow our guide to making it run quieter than an extra in a Chaplin film over on p116...

### A series of tubes

One of the best web MEMEs is Senator Ted Stephen's diatribe against net neutrality, in which he likened the internet to a "series of tubes". [eightchainedourangoutangs.com](http://eightchainedourangoutangs.com)



### There's a hole in my Vista

It's not out the door yet – or even to Release Candidate stage, for that matter – and already experts have found what they claim are serious security holes in Windows Vista. According to Symantec, several Vista features, including some protocols related to its redesigned networking technologies, could become a major problem if Microsoft doesn't fix 'em soon.

# Fight the power

The government is calling you a wastrel. So what are you going to do about it?

**C**omputers have been a fashionable whipping boy for the green lobby for years and, as much as you hate to admit it, that games-playing, music-downloading centre of your life is one of the least eco-friendly appliances in your house. Not only does it consume 10 times its own weight in chemicals and fossil fuels as part of its manufacture (according to the UN), obsolete computer equipment counts for 70% of the heavy metals polluting landfill sites.

So when the government, in its recently-published Energy Review, said that you're wasting 8% of all the electricity that your household uses by leaving gadgets and devices on standby, you should take note. Short of building your very own waste metal re-processing plant in your back yard, it's one of the few

ways you can lessen your PC's impact on the environment. Oh, and did we mention that it'll save you money, too?

"The prime source of greenhouse gas emissions is the production and use of energy", says the Prime Minister in opening the report. "If we are serious about tackling climate change, the centrepiece of our programme must be in ensuring

we power our way of life in a much cleaner, greener and far more efficient way".

It's "our

way of life" that's the biggest blip on the horizon. At present, 25% of all the electricity generated in the UK is used to light our homes and power the shiny white goods contained therein. This is set to rise by 20% by the year 2020 due to new energy-hungry products with games consoles and PCs being singled out for particular

**"The way we power our lives must be cleaned up"**

**top stories**

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**FREE ME?**

**Multiple OSes on the cheap?**

**p17**

**BORROWBAND**

**Free internet use anywhere**

**p18**

**OLD BIRD**

**Celebrate 15 years of Linux**





**Alec Meer**  
DREAMS OF ROBOTS

## Do legal film 'leaks' help or hinder?

The first 24 minutes of *A Scanner Darkly*, the Kerplunku Reeves-starring adaptation of Philip K Dick's novel is online. Free. Legally. That's 1,440 seconds.

It's a hell of a gambit. Either director Richard Linklater is determined to embrace web-as-marketing-tool or the studio behind the movie is afraid its oddball look precludes commercial success.

Me, I can't decide what I think. I stopped watching about three minutes in because, were I to watch the lot, I'd then be able to decide whether I wanted to drop a painful amount of shekels on seeing the full movie. I actually enjoy the element of risk in going to see an unknown prospect.

You've got to be confident in your product to make such a large amount available for free – if it's great, it could mean an awful lot of box office, but if it's bad or, as the case seems to be, too heavy a prospect for your average cinemagoer, a load of people who were previously tempted to take a Saturday night risk may no longer be. I admire and appreciate this move, but if it's to become the norm it'll mean a bumpy transition for the movie industry.

## Top five power-saving tips

- 1 If you're a heavy downloader, use a laptop or older PC that can be underclocked to save on power. Both will run cooler than a performance desktop, requiring less juice for heat sink fans.
- 2 Don't bother with a screen-saver; use the automatic power-off feature from within Windows to simply turn your display off after a set period of inactivity.
- 3 Use a pair of headphones instead of powered speakers. A set of cans like Creative's 5.1 channel MegaWorks munch through electricity but a pair of Sennheiser phones don't and X-Fi offers great surround sound with both.
- 4 When winter rolls around, don't heat your PC room. A Dell XPS 600 (shown here) gives off 685BTUs running a game (and 484BTUs idle), which is enough heat to boil 1 litre of water every hour.
- 5 Get an LCD monitor. A typical 21" CRT monitor will use 122 Watts per hour, but a 19" LCD-TFT screen will only burn through 35 watts, cutting energy consumption in half.



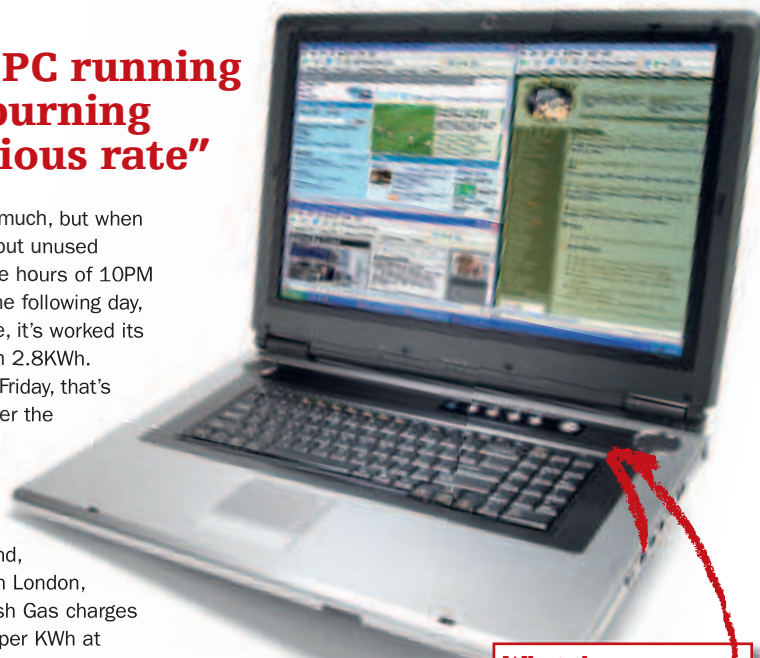
## "If you leave your PC running overnight, you're burning electricity at a furious rate"

mention) so cutting back on the amount of juice we're using is important. After all, considering that there are more reasons than ever for us to turn our computers on in the first place these days, we need to make the savings somewhere.

Take downloading, for instance. If you leave your computer running overnight or while you're at work, you're burning electricity at a furious rate. Your PC alone – without factoring in a monitor, printer, speakers or any other peripheral – will consume around 0.14 Kilowatts an hour when running, without any active applications. This might not

sound like much, but when it's left on but unused between the hours of 10PM and 6PM the following day, for instance, it's worked its way through 2.8KWh. Monday to Friday, that's 14KWh. Over the course of a year, that works out at 728KWh and, if you live in London, where British Gas charges you 8.98p per KWh at night, it'll cost you a decidedly hefty £65.42.

Sticking your PC on standby (also known as 'sleep') isn't much better, while shutting it down but



## What those power states mean

**Standby**, which is infinitely more useful in a laptop than a desktop, involves turning off your monitor, graphics card, sound card, hard drive and optical drive but not, crucially, your CPU and RAM. These stay turned on, though on low-power, as your system state is saved in the memory, not on the PC's hard drive.

**Hibernate** takes the concept a step further, shutting down everything and writing the system state to the hard drive. It is, essentially, as good as shutting your system down, as all of the components are powered off, the only downside being that a folder equal to the size of your RAM is kept in the root directory of Windows for this purpose, even if it's not being used.

leaving it plugged into a turned-on mains socket still consumes electricity, though admittedly it's so small as to be insignificant. So what's a PC user to do? Well, you can start by following our list of top power-saving tips above and making sure that you use energy efficiently. It's worth working out just how much money all those peripherals are costing you, too. Because even if you're not interested in conserving the planet, we're betting you are interested in conserving your money, and there's a lot of that to be saved. **PCF**

## What your hardware costs per hour

2GHz Pentium 4 desktop PC (idle) – 0.14KWh – 2.658p
2GHz Pentium 4 desktop PC (stand-by) – 0.12KWh – 2.278p
19" LCD monitor – 0.035KWh – 0.664p
Multi-function inkjet printer (standby) – 0.015KWh – 0.284p
Ultra-portable laptop (idle) – 0.022KWh – 0.417p
Ultra-portable laptop (stand-by) – 0.003KWh – 0.056p
Performance laptop (idle) – 0.042KWh – 0.797p
Performance portable laptop (standby) – 0.004KWh – 0.075p
(Selected figures from <a href="http://www.eu-energystar.org">www.eu-energystar.org</a> . British Gas' daytime rate of 18.98p per KWh used in calculations).

## THEY SAY

"We need to put a much greater emphasis on the efficient use of energy. Such changes not only cut bills but also cut carbon emissions." Tony Blair, 2006



Like a bootlegged virgin: it's Madonna versus Branson.

# Madonna copied

Virgin pirates pop legend's single – then sells it

**E**veryone knows that big business has a very different take on morality to the common man, but this is a whole new scale of weird. The French arm of Richard Branson's enormous Virgin empire has been found guilty of pirating the Madonna single *Hung Up* – and reselling it on its website. It's having to cough up over £400,000 in damages to Warner Music Orange for violating their exclusive agreement to distribute Madge's latest offerings online and to mobile phones. "Virgin behaved in a surreal manner

by downloading the song, cracking the protection measures and then selling it directly from its own website," opined France Telecom's Herve Payan.

The strange decision to download a song from a rival firm, then repackage it for reselling aside, there may well be slightly more going on here than initially meets the eye. It seems that Virgin France sees its actions a sort of protest against the increasing trend for exclusivity in the music download market. "We have always been ahead of the others, posing

questions that look to the interests of consumers," claimed store director Laurent Fiscal. "We are precursors in the question of exclusive sales and think a debate should take place between sales platforms and producers."

Virgin France has been attacking record labels over this kind of exclusivity for a while now – a move we applaud, but we can't help but worry that this kind of behaviour is only going to convince the music industry's bigger players to favour certain online distributors over others and increase DRM.

## Online oppression

Amnesty encourages websites to spam censors

**A**fter 40 years inflicting sciatica on oppressed postal workers thanks to its prolific letter-writing campaigns, Amnesty International has expanded its remit to cover digital rights and wrongs, as well as the more mundane judicial ones. It's no longer just prisoners of conscience that are worthy of Amnesty's attention, but websites too. The world-renowned charity is taking

its belligerent spam-'em-til-they-stop strategy online and fighting the good fight against internet censors the world over.

In the wake of the Google-in-China and MSN blogs scandals, Amnesty's involvement in protecting freedom of speech online is very welcome. The tactics being employed are simple and effective. As well as the obligatory protest email ploy, Amnesty also encourages its supporters

to cut and paste a small HTML banner into their own sites – these then pull random pieces of text from Amnesty's archives of banned political material. The theory is that by overwhelming the net with censored speeches and banned political bon mots, the censors in countries that filter their citizens' access to information will be unable to keep up.



50%  
STAT!

The percentage of laptop hard drives that could employ flash memory-style solid state storage technology by the year 2013, according to research by industry analyst In-Stat.

## TIME STARVED

Literally minutes of online fun

### 1 MASHED UP

A unique music creation application. There's a 60-day demo at [audiomulch.com](http://audiomulch.com), which we'll be covermounting and running a tutorial on next issue.

### 2 NET MORONITY

One of the US Senators fighting against net neutrality offers his own astoundingly wrong description of how the web works. Hear it at [media.publicknowledge.org/stevens-on-nn.mp3](http://media.publicknowledge.org/stevens-on-nn.mp3).

### 3 DESK BUDDY

A USB puppet that springs to attention when an instant messenger contact comes online and collapses when someone goes offline. [schulzeandwebb.com/2006/availabot](http://schulzeandwebb.com/2006/availabot)

### 4 ULTRA CABLE

Ideal for projectors in the garden or an HDTV set in the next room – create a VGA lead up to 50 feet long without signal degradation by using CAT5 network cabling. [www.myhometheater.homestead.com/vgacable.html](http://www.myhometheater.homestead.com/vgacable.html)

### 5 SHAMELESS PLUG

Regular PCF contributor Kieron Gillen has written a comic, released this month by major US publisher Image. It's about music, magic and, inevitably, himself – more at [www.phonogramcomic.com](http://www.phonogramcomic.com).

Calm on the surface, but the fattest of fat pipes throbs underneath Goonhilly.

© Goonhilly Satellite Earth Station Experience



## QUICK FIX OF THE MONTH

**Q** My copy of Windows refuses to load, citing "NTLDR is Missing". Why?

**A** Nasty one, this, but very common. First up, check your boot device priority in the BIOS – is the hard drive with your Windows install set to boot first? If it is, you're probably looking at a corrupt NTLDR or NTDETECT.COM file, essential to start-up, but borked because of a crash or general Windows flakiness. To fix it, boot from your Windows XP CD (this may require changing the boot order preference in the BIOS), and click [R] when asked to enter recovery mode. Choose your XP install and enter an administrator password if relevant (hit [Enter] if not), then type `e:\i386\ntldr c:\`, followed by `e:\i386\ntdetect.com c: -` replacing `e:\` with your CD/DVD drive letter if it's different, then reboot.

This will copy clean versions of the files in question into your XP install. If the problem persists, repeat the process, but type `fixmbr` and then `fixboot` once in recovery mode.

## Cafe Express-o

**C**ornwall, oft considered out on a distant limb from the rest of England, should feel separation anxiety no longer. The entertainingly named Goonhilly Satellite Earth Station (on the Lizard peninsula, no less) now has its own pair of internet jump-leads connected directly into BT's global internet protocol network, meaning you can merrily waste the 100Mbps download

speeds sending emails and nattering to mates on MSN. Best of all, its net café is free for visitors to use.

Of course, ideally we'd like to commandeer one of the 61 satellite dishes speckling that particular patch of Cornish countryside and repurpose it as an enormous wireless access point, covering the entire south of England. That way, all those still

getting the internet through a string with cups on each end could finally experience the exquisite-yet-hollow joy of wasting four hours on YouTube of an afternoon.

[www.goonhilly.bt.com](http://www.goonhilly.bt.com)

## Cheap as chips

### AMD feels the Conroe pinch – and promptly drops prices

**C**hip giant AMD's in a funny place at the moment. The socket-shift to AM2 may mean great potential for future chips, but right now, even with DDR2 memory to play with, the latest cores

just can't compete with Conroe's superior architecture. And there's the thorny subject of pricing, too. With the basic Conroe core (which can be overclocked to match FX62 performance) coming in at around £150, the bunfight has begun in earnest.

So, the only option left to AMD right now is to drop prices – which it has. Browse a range of e-tailers at the moment and you'll find some incredible bargains. The prices below are the cheapest we've found from a variety of popular online stores, and they're going to get cheaper, so revisit to ensure you snap up a bargain.

Model (AM2-single core)	Speed (GHz)	L2 Cache	Price (£)
3000+	1.8	512K	65
3200+	2.0	512K	70
3500+	2.2	512K	78
3800+	2.2	1MB	85
4000+	2.4	1MB	110
X2 3800	1.8	1MB	200
X2 4200	2.2	1MB	240
X2 4400	2.2	2MB	320
X2 4600	2.4	2MB	365
X2 4800	2.4	2MB	440
X2 5000	2.6	2MB	480
X2 FX62	2.8	2MB	680

# Win! A system upgrade and boost your rig

While you're pondering the answer, why not head over to [www.giga-byte.com](http://www.giga-byte.com) and do a bit of Windows shopping?

Keeping up with the ever-changing world of the PC is a daunting task, and most of us just can't afford to keep pace with the unremitting mistress that is progress. Whether it's the six-monthly 'best ever graphics card' or the latest in dual-core processing technology, it's all too easy to get left behind in the rush for new toys.

Thank The Maker, then, that you lucky people have PCFormat, not only to guide you to the best buys, but to convince companies such as

Gigabyte to give away its stuff away for a few mere mouse-clicks.

This issue, Gigabyte is generously offered one lucky reader an upgrade pack par excellence, comprising a Poseidon PC case, a PCI-Express, NFORCE4 Socket 939 motherboard, a neon CPU cooler, dual-format analogue/digital TV tuner – and the ace in the hole: a 7600GT with the Silentpipe II passive heatsink. What more could you ask for? Al Bickham coming round to fit it for you himself?

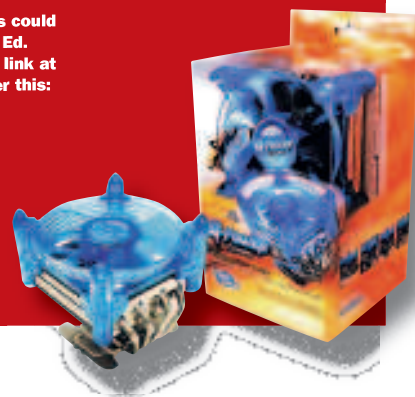
Sorry, folks. Not even Bill Gates could afford the services of our Tech Ed.

To enter, follow the compo link at [www.pcformat.co.uk](http://www.pcformat.co.uk) and answer this:

**How many bytes are there in a Gigabyte?**

- 1,000,000
- 1,000,000,000
- 1,000,000,000,000

Competition closes 7 September 2006  
Terms and conditions are on the website.





It's not even out the door yet and Microsoft's next Windows has already been malwarred.

## Bitter pill

Undetectable malware created – and even Vista is vulnerable

**T**hose well-versed in comics lore will know that there comes a time in every superhero's life when they must choose whether to use their powers for good or evil.

Going on recent evidence, we're becoming increasingly worried about which choice Joanna Rutkowska, of the Singapore IT company COSEINC, is going to make. You see, by day Joanna is a (possibly) mild-mannered researcher, but by night she has been developing a way of creating malware that is completely invisible to the operating system, thus undermining any virus or malware-detecting programs. Her creation already runs on the 64-bit beta version of Vista, months before the final edition is due to surface.

### WILY SUBTERFUGE

Should she choose the forces of light, and the fact she's demonstrating the technology at the SyScan '06 security conference suggests that she

is, then perhaps this new method could be used to develop a countermeasure. Of course, the fact that Ms Rutkowska will also be visiting the Black Hat Briefings, which will be riddled with nefarious hacker types, suggests she could be flirting with the dark side as well. Either way, it's an

**"A turning point in the battle against malware"**

extremely elegant method of avoiding detection. Using AMD's SVM/Pacifica virtualisation technology, the app runs under a super-thin visor, deftly avoiding the new requirement in

Vista for all kernel mode software to have a digital signature. The visor can

be activated on the fly and has little or no effect on system resources.

### NO LAUGHING MATTER

We can't help but find it worrying that Vista's new security measures have been so spectacularly undermined before the OS has even gone live. Linux users, who may be chuckling at this point, aren't necessarily safe either, as Rutkowska suggests that the concept could theoretically be applied to any operating system.

Fortunately, there are no plans to make the code widely available at the moment, but depending on which colour cape Rutkowska chooses to wear, this could be a genuine turning point in the battle against malware.

## wøøt

**Inter-messaging**  
Microsoft's Windows Messenger Live and Yahoo! Messenger now talk to each other, as long as you have the latest beta versions – it's a promising step forward for cross-platform IMing.

**Microsoft slapped**  
MS is to be fined by the EU for not complying with the 2004 anti-trust ruling which stated it was abusing Windows' dominance on the OS market. Just how much it'll pay is TBC, but it could be as much as £2m a day...

**Huge robot museum**  
God bless Japan, and all who design incredible automata in her. Details at [tinyurl.com/pebxxn](http://tinyurl.com/pebxxn)

### SLI wars

Rumour has it that Intel won't be supporting SLI for motherboards that use its landmark Conroe chip. The reason? A deal with ATI to support Crossfire, its own proprietary dual graphics card system.

### Death of IDE

Intel has announced impending southbridges without dear old IDE. Which would be fine, except for the fact you can't find SATA DVD drives for love nor money...

### eBay postage

The auction site is the best place for a bargain, but the lack of regulation on seller postage charges means you'll usually end up paying a small fortune for a re-used Jiffy bag and a second-class stamp.

## møøt

**HEARD THIS?** "Different treatments have been created... to either highlight the whiteness of the new model or contrast the black and the white models." Sony defends its Dutch PSP billboard campaign, depicting a white girl apparently attacking a black girl.

## WHO IS... Bram Cohen Author of BitTorrent



### Bram? Author? Victorian horror novelist as well as programmer?

Yes, yes. Very clever. Bram Cohen is actually the brains behind peer-to-peer file-sharing beast BitTorrent. Learning BASIC on his folks' Timex Sinclair at the tender age of five, he went on to enjoy the dotcom boom of the late 90s after dropping out of college. He took his idea of breaking files into manageable, easily downloadable chunks from a previous project, MojoNation.

### Filesharing? So he's enemy No1 in Hollywood then?

You'd think so, but he maintains that he's never violated any copyright law with his software. And only recently his San Francisco-based company announced a deal with four indie film studios that will enable it to sell over 1,000 titles online as part of a new subscription service.

# Unlimited PCs for free

## Free MS app means multiple operating systems on one PC

**W**ell, sorta. Microsoft has just released the formerly £150 *Virtual PC 2004* for free. So what, you may say, but the move could prove a massive boon. What it does is enable you to run other operating systems from within XP – or, with the forthcoming (and similarly free) *Virtual PC 2007*, from within Vista. This is potentially a godsend if, as we expect, a bunch of much-loved apps and games don't work with the new version of Windows due out next year.

If they don't, fire up *Virtual PC*, which, in turn, launches XP from within Vista, and it's business as usual. And just think about your old games. *Quake II* won't give you such gip if you fire it up in Windows 95,

and *TIE Fighter* will work a treat from your virtual DOS partition. You could even use VPC to run a batch of Linux distros, without worrying that they'll muck up your master boot record or Windows install.

The cynical might see the move as a vague riposte to Apple's Boot

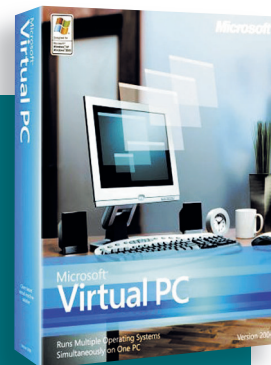


**We'll run a tutorial on using *Virtual PC 2004* to play old games next issue.**

Camp, the application that enables owners of its Intel-based machines to run Windows XP as well as OSX. In reality, it's a world away – unless, of course, an easy way to run OSX from standard PCs is hit upon, in which case *Virtual PC* would be a massive pain in the bits for Apple.

That aside, there's no denying that virtualisation is The Next Big Thing for the IT industry – security and stability are that much more pronounced for applications run inside a virtual shell than from your key operating system proper.

Should disaster strike, be it corrupted data, malware or so forth, whatever happens in that virtual space won't affect your important files. [www.microsoft.com/virtualpc](http://www.microsoft.com/virtualpc)



## BT bites back

**U**nder the heading **Total** Broadband, British Telecom is launching a raft of new gadgets and services for the home. Everything will be routed through The Hub, BT's wireless router, the idea being that the internet should be embraced for

communications and entertainment. Could've told them that years ago...

Along with videophone and voice-comms, Total Broadband offers home security with WiFi webcams, and the star of the bundle, BT Vision (see the



IPTV feature in PCF189).

This DVB set-top box offers digital Freeview and a host of online TV, music and movie services. The basic package (hub, VOIP phone and 8MB broadband) starts at £9.95 a month. For details, visit [homehub.bt.com](http://homehub.bt.com).



## Lo-Fi

Bad meeting, poor weather, lousy traffic.

It's going to take hours to get home and I have to put up with dreadful sounds from my in-car entertainment system.



## Physical challenge

**PCF** has quizzed **PhysX** creator Ageia about the discovery that flagship physics card-enabled game *Cell Factor* will work without the dedicated hardware. It confirmed that the game doesn't give PhysX the workout it deserves, but pointed out that the card's role is not so much to create new effects as take the weight of handling complex tasks off the CPU. So

what of ATI's plan to use a second graphics card to handle physics? Ageia claims its physics processing unit (PPU) is very different to a GPU. While the raw data throughput of a GPU may be greater, it can't flexibly respond to the feedback required to run heavy physics algorithms as well as Ageia's chip. Makes sense, but we'll try the PhysX alternatives before passing judgement.

## QUOTE!

"[I'm] very worried and feeling very let down by my own government."  
Hacker Gary McKinnon (see PCF177) fights against his extradition.

## BEST OF THE PCF BLOG

Remember to bookmark [blog.pcformat.co.uk](http://blog.pcformat.co.uk), our online home for all PC-related randomness

### Advantage, Microsoft?

Microsoft has gone out of its way to reassure the general public that its Windows Genuine Advantage tool isn't actually gathering any personal data from the folk it scans. It doesn't stop counterfeit software from working and doesn't get the boys in blue round either. So, er, what's the point?

### Assault on the senses

Check out the June archive of the blog for our video showing off some of the things you can do with NaturalPoint's TrackIR head-tracking system. It's all put together with the TrackIR3 and details the basic head motion controls available.

### Free VoIP to landlines

It's the holy grail of internet telephony - free calls to national landlines as well as to whomever is using the same VoIP client as you. Check out the blog to see if the dream's come true.

## Free roaming

Are we finally going to see wireless without strings attached?

**J**ourney with **PCF** into a shining vision of the future. Imagine a place where you can sit in any street in the country, whip out your laptop or PDA, and connect instantly to the internet by borrowing bandwidth from a house nearby.

Sound too good to be true? Well, it could happen, thanks to a Spanish company, called Fon ([en.fon.com](http://en.fon.com)), which plans to turn as many residential internet connections as possible into publicly available access points. Of course, given that charity is thin on the ground these days, there has to be a financial incentive for both the provider of the home connection and

the company itself. Fon has those bases covered, though, by ensuring that if you are sharing, you also gain free access to all the other access points. Where Fon makes its money is from people who aren't sharing - Aliens, as Fon refers to them, pay a €3 for 24 hours of access. Most interestingly, in order to hurry this plan for world domination, Fon is offering subsidised routers to widen the network's coverage. Repurposed Linksys (pictured above) and Buffalo devices are flogged on the site for a mere €5 (around £3.50). Sadly, if you

The Linksys WRT54GL router, with custom open source firmware, is being used for the project.



bothered to read the fine print on your broadband terms and conditions, you'll have noticed that most of ISPs aren't keen on you letting any Tom, Dick or Linus borrow your connection. While putting extra strain on their network and losing customers probably isn't high on providers' lists of fun things to do on a Saturday night, we hope at least some see the light and are rewarded for their bravery. We're increasingly yearning for a wireless world and a model like Fon's could well be the answer. [en.fon.com](http://en.fon.com)

**"Fon's model could well be the one we're waiting for"**



## Hi-Fi

Got it sorted - I'm happy now!

Choose from prestige car hi-fi brands at fully installed prices and purchase online. All products are installed by a FOUR MASTER expert of your choice and covered by a 3-year nationwide guarantee.

## Team Fortress 2 lives!

Shock return of Valve's multiplayer shooter



TF2's cartoony look means you wouldn't guess it was Source-based.

Before Counter-Strike, there was Team Fortress, the multiplayer mod for the original Half-Life and early Quakes. For a while, anticipation for the oft-delayed sequel ran far higher than it did for Half-Life 2. Then time passed, and Battlefields, Enemy Territories and Days of Defeat ran off with the teamplay crown. Valve intermittently confirmed that Team Fortress 2 was forthcoming, but the world had forgotten about it.

Then, in a shock announcement, TF2 lives again, Source Engine-based and to be bundled with the forthcoming Half-Life 2 Episode 2 (see p.24). Details are reasonably limited, beyond that the much-loved formula remains the same, but there's now an odd, cartoony visual style. It takes some getting used to, but not looking like yet another Source shooter is a smart move. Given that Valve caught a lot of flak for Episode 1 being so short, the inclusion of a new multiplayer game should offset the complaints about poor value for money. This is much more like how we'd like to see this episodic schtick play out. More news on this team-based lazarus next month...

# Many happy returns, .co.uk

Nominet celebrates its 10th anniversary with both eyes on the future

**N**ominet, the not-for-profit organisation responsible for managing the database of domain names ending in .uk, is celebrating 10 years at the top. When Nominet took over in 1996 there were 26,000 registered names on the database. Now it's over five million, and the .uk domain has become the fourth-largest registry in the world.

Nominet's vision of the future is phone-based. It is looking to run the 4.4 code of the Electronic Numbering Protocol (ENUM) for the UK, a method of turning your phone number into a domain name. This allows the unification of the phone system with online telephony. With your number changed into an online entity, you would be able to use it for voice calls, fax, mobile, emails and texting on a range of devices.

Bad news for BT, and so soon after it was named best UK ISP (below), and with Sky's

announcement that it's to provide broadband to its customers too. It's turning out to be quite a gruelling month for the status quo...

**".uk is the world's fourth-largest domain"**



# HD-DVD hacked already

**W**ho'd have thought that a long-forgotten old button still had so much to offer? It seems HD-DVD and Blu-ray, the high-def follow-ups to DVD, have been undone already – by the hoary old Print Screen key. Pressing it grabs whatever

is currently playing at full resolution, regardless of the HDCP tech that downscales the image if it's not played on fully compliant hardware.

If some clever tyke can come up with a simple program to capture each frame in such a manner, then bond it

to the easily-extracted audio stream, presto – a perfect digital copy. The method has been tested with Sony's first Blu-ray PC, the Vaio VGC-RC 204 and Toshiba's Qosmio G30. Toshiba quickly stated it has updates planned to close down this embarrassing hole.



The all-seeing ISP of BT snags an award.

# Fast, faster, fastest

UK's best ISPs revealed

It seems to be something of a trend in technology for speed to become less and less crucial to how effective something is. Take processors – the fastest Core 2 Duo is less than 3GHz. Or graphics cards – it's largely the number of shaders rather than how many Megahertz the GPU runs at that dictates game performance.

It's the same with ISPs – that on-paper bandwidth doesn't mean much in the face of throttled downloads, peak times, dropped connections and contention

ratios. Monitoring firm Epitiro (which actually describes itself as something to do with customer solutions, but we can't quite translate the corporatespeak) is behind the so-called ISP-I survey, which has revealed the best ISPs in the country.

Perhaps suprisingly, given how late it was to the broadband party, BT tops the list. "Our consumer ADSL testing found that in terms of Internet performance, BT topped the overall rankings for the period April to June 2006. BT was also found to

provide the fastest service as a percentage of its theoretical maximum," says Epitiro MD Gavin Johns. Virgin, AOL, Orange and Demon brought up the rear, each being praised for their speed at delivering email (some up to four times faster than the average) as well as internet connection.

Interestingly, Epitiro reckons the most common broadband speed in the UK is now a relatively meaty 2Mb/s. [www.epitiro.com](http://www.epitiro.com)



# 15 years of Linux

Tomorrow, the world. Maybe

**L**ast month's 65 Greatest PC Moments feature stirred up a predictable, and intended, hornets' nest of controversy. Some of your suggestions were worthy, some entirely crazy, but there was one serious omission we have to hold our hands up to. In September 1991, Linus Torvalds released version 0.01 of his free operating system, Linux, onto the internet. 15 years later and it, in its many different flavours, is now the only serious rival to Windows on the PC. Coincidentally, PCFormat is also 15 this year – and we've recently started to increase our Linux coverage because we feel it's finally at the point where it is a true alternative to Microsoft's bloated efforts. It's certainly come a long way from Torvalds' original pleas for ideas on a Minix message board, establishing a thriving community with a year, and multi-million dollar



investments from big names like IBM within a decade. Thanks to the big happy, helpful family of the internet, it's now more popular than ever, with new distro on the block Ubuntu in particular winning legions of fans previously prohibited because they didn't feel there was enough support available. In geek elite circles, Ubuntu has even supplanted OS X as the cool operating system of

choice, partially because of its ease of use, partially because Apple is now so big it's increasingly hard to consider it alternative. We've said it before and we'll say it again – it's only the lack of easy, widespread gaming support that keeps us from a total switch to Linux. Here's to another 15 years.

[www.linux.org](http://www.linux.org)

## Killing in the name of...

PCF embarks on a marathon Quakeathon for Sport Relief

**V**ideogames are enjoyable. So is eating ice cream – for, say, the first 12 spoonfuls. Do it for seven hours and you'll feel absolutely awful. Which pretty sums up the PCF team's take on playing a 1,000-frag match of *Quake IV* in aid of Sport Relief in July.

We've all done more seven-hour gaming sessions than we'd care to remember, but it's a very different prospect when it's just a single match of a multiplayer shooter – there's absolutely zero down-time, just constant ultra-violence. You snooze, you lose. We didn't snooze, but our ravaged bodies very much lost. Fortunately, Al, James, Alec, Mike, Dave and ringer-from-PC-Plus-Alan Dexter's exertions were worth the gruelling effort – we exceeded the £1,000 sponsorship target we set ourselves. This was then matched by our parent company Future, meaning around £2,200 earned for Sport Relief, which goes to help children and communities in need across the world – see [www.sportrelief.com](http://www.sportrelief.com) for more details.

At the time of writing, we don't know whether the online sponsorship mini-site for the Quakeathon will still be live by the time you read these words, but if you feel like post-sponsoring us, please give [tinyurl.com/jkqzm](http://tinyurl.com/jkqzm) a quick spin in your browser. The match itself was a close-run race between Al and eventual winner Alec. In reality though, everyone was hysterical [example – an interlude in which we attempted to quote the entire introductory dialogue from *Quantum Leap* by about the 500-frag mark, so everything that followed was really more by luck than judgement. Many thanks to all who sponsored and supported us; less thanks to those who refused because “pffft, it's just a videogame”. We haven't been able to bring ourselves to play *Quake IV* since – all ideas for a replacement lunchtime multiplayer game gratefully received.



The match was played on the all-too-appropriate The Longest Day map.

## NEWS IN BRIEF

### Linux-powered robot frenzy

At last – a fusion of two of geekdom's greatest obsessions. The oh-so-Japanese HRP-2m Choromet is just over 12" tall and contains a 240MHz CPU and 32MB of RAM – in other words, it's a PDA on legs. It runs ART ('Another Real-Time') Linux, meaning that unlike, say, RoboSapien, it's completely programmable. [tinyurl.com/lsjp8](http://tinyurl.com/lsjp8)



### MySpace hacked

The worldwide hub for goth teenagers, bedroom bands and casual sex partners turned out to sport a massive hole in its closely guarded security. Look at an infected page and you'll be dragged to a crazy rant about 9/11, before having your own profile infected to boot.

### Skype outed

The seemingly unstoppable VoIP application has hit something of a roadblock – its protocol has been cracked, allowing third-party apps to access its networks. Whether action will be taken against this or if it'll lead to a golden age of cross-network chat remains to be seen.

## QUOTE!

"More research and innovation – investing for growth and employment." The motto of an EU parliament majority calling for more support of open source.



**Jeremy Laird**  
HIGH-DEFINITION HIATUS

**Want HDTV?  
Then look but  
don't touch...**

**Cast your eyes across the page and you'll see some of the first examples of the latest, and very possibly greatest, distribution models for HDTV. IPTV is a simple concept: pushing video to users via an internet connection. However, it's only become a realistic proposition in the UK thanks to the recent ballooning of connection speeds.**

**The Matrixstream IMX1020 is certainly an intriguing piece of kit. And I welcome the arrival of any new technology that promises to put a bat up the nightdress of Rupert Murdoch. But it's also a sad reminder that the one device capable of unifying the unholy mess of HDTV formats, disc technologies and distribution platforms is the one device that's being barred from joining the party. Yup, that's right – the good old desktop PC.**

**It's easy enough to picture the ultimate HDTV home theatre PC, packed with next-generation video disc drives, an HDTV tuner card and topped off with a subscription to an HD IPTV service. But with the likes of Sky and Telewest so far refusing to allow their services to be tuned on a PC, it's as far from being a reality as ever.**

# Gearedup

**GADGETY REASONS TO BE CHEERFUL**

## Sensational set-top



### Matrixstream IMX1020

**Price** £200 (with service subscription) **Available** Winter 2006 **Web** [www.matrixstream.com](http://www.matrixstream.com)

It's early days for HDTV services in the UK and as yet there ain't much choice. Your only options are Sky's satellite HD service or Telewest's cable-based offering. Either way, you're looking at a mass-market package aimed at the lowest common denominator of pea-brained punter. But what if there were an alternative technology, a distribution platform that enabled relatively tiny companies to set up their own HDTV stations and

compete with the big boys? Well, there is: it's called IPTV and this unassuming Linux-based set-top box could represent the beginning of the IPTV revolution. Simply plug the Matrixstream IMX1020 into your router, hook up with a service provider and sit back as the HD goodness is piped down your connection. For now, Matrixstream only offers set-top boxes. But the company claims a PC-based offering is on the cards.

#### Video on demand

With connection speeds rising, the arrival of online HDTV services is fast approaching. In fact, Matrixstream reckons the first UK services will be running before the end of 2006.

#### Comprehensive connectivity

With HDMI, S-Video, component and composite interfaces on offer, the Matrixstream IMX1020 has all the video output options covered.

#### Big image quality, small bandwidth. Kinda

Thanks to support for the latest and most advanced video codecs, including H.264, a 4Mb internet connection is enough for full 720p video streaming. Storage options start with an 80GB hard drive.



#### Taking on Sky

In theory, any company with a room full of servers, an internet connection and the odd content distribution licence can set up shop and begin streaming HDTV services to the Matrixstream IMX1020.

#### HD IPTV for my PC?

While Matrixstream reckons it may offer a PC-based IPTV service in the near future, it's likely that fears regarding content-protection will prevent PC-compatible, high-definition IPTV services from appearing any time soon.

## Slick shutterbug



### Sony Alpha DSLR-A100

**Price** £600 approx **Available** Now **Web** [www.sony.co.uk](http://www.sony.co.uk)

In July last year, Konica Minolta and Sony announced a tag-team effort to design products for the painfully competitive digital SLR camera market. So when the former confessed six months later that it was pulling out of the market altogether, few were surprised. Many of Konica Minolta's camera technologies then passed to Sony, and this is the result: the first digital SLR effort from the Japanese electronics giant. A compact, 10 megapixel CCD-powered unit, the DSLR-A100 is compatible with Minolta's back catalogue of A-type bayonet lenses, boasts a dual-mode dust reduction system and is capable of 750 shots per charge.







### Classic chassis



## Origenae X10

Price £140 Available Now Web [www.origenae.com](http://www.origenae.com)

Genuinely high-quality, stylish PC cases remain a rarity. Forgive us, therefore, our geekish enthusiasm for this sleek-looking HTPC offering from Origenae. Superficially, it's yet another hi-fi-aping, all-aluminium chassis. But the fine details of the spec list reveal an extremely promising package. In the name of noise reduction, for instance, the X10 is hewn from high-density extruded aluminium and sports vibration-absorbing grommets at every drive mounting point. Cooling is also claimed to be carefully managed and the chassis's relatively generous proportions accommodates the use of full-sized ATX motherboards and PSUs, along with the latest high-end graphics cards.

### Mother of all boards



## Foxconn 975X7AB-8EKRS2H

Price £175 approx Available Now Web [www.foxconn.com](http://www.foxconn.com)

With Intel's fancy new Core 2 Duo beating seven shades out of AMD's wilting Athlon 64, your weapon of choice in terms of PC processor is obvious enough. But which motherboard to pair it with? Well, Intel's CPUs often work most efficiently when paired with a chipset from the mother company. So this bafflingly monikered Intel 975X-equipped Foxconn offering should deliver top-drawer performance. What's more, it marks itself out from other 975X motherboards, courtesy of its digital, rather than analogue, power-management module. This enables the capacitors around the CPU to be dumped, which reduces heat output and enhances performance.

### Assured sonics

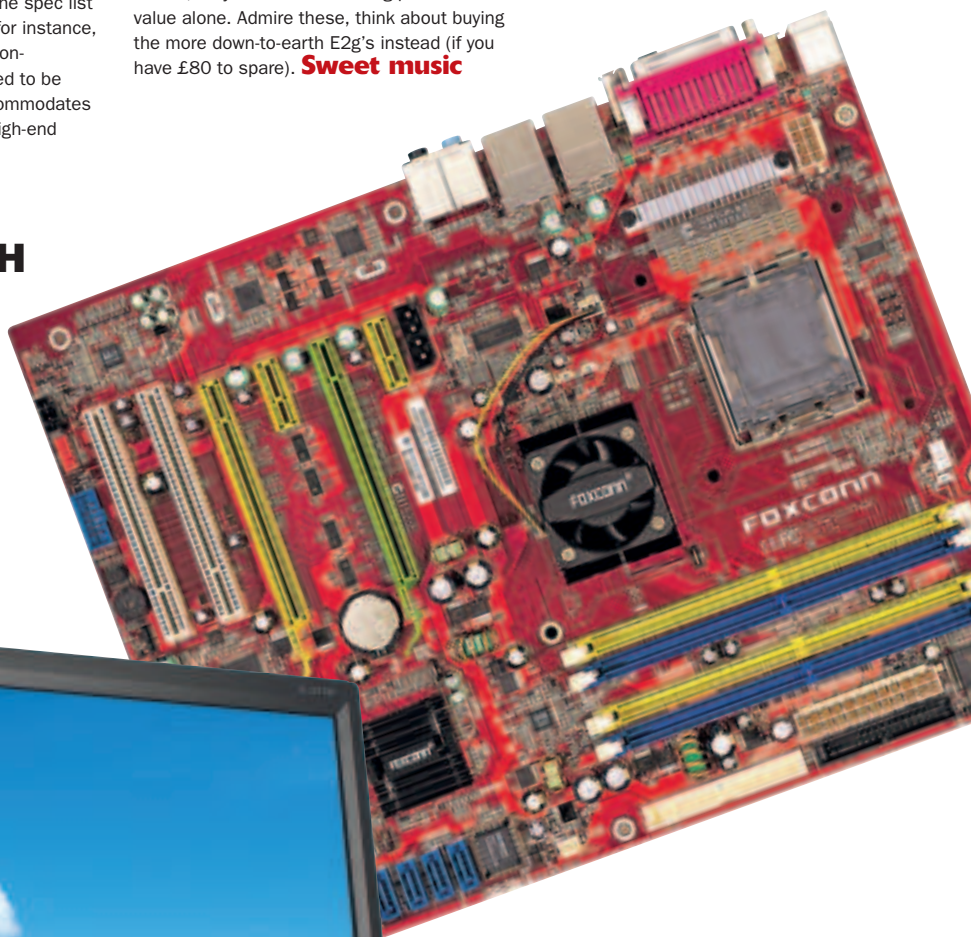


## Shure E500PTH

Price £500 Available September

Web [www.shure.co.uk](http://www.shure.co.uk)

More commonly seen providing top-notch 'plugs to studio pros and real-life musicians, audacious audio manufacturer Shure now plans to entice gamers with a dedicated range of ultra-fine 'plugs tailored to full-fidelity fragging. Its premier E500PTH 'plugs may be priced a little beyond the ambition of most *Quakeheads* at somewhere around a week's wages per ear, but with three speakers per piece and a microphone pack to allow the outside world in at the touch of a button, they're worth the asking price for chic value alone. Admire these, think about buying the more down-to-earth E2g's instead (if you have £80 to spare). **Sweet music**



### Image is everything



## Acer AL2616W

Price £TBA Available September

Web [www.acer.co.uk](http://www.acer.co.uk)

2006 is truly the year of the hugola widescreen PC monitor. After the terrifying beauty of Dell's 30-inch 3007WFP and a fleet of 20- and 24-inch models from the likes of HP, BenQ and Samsung, Acer is joining the party with this uniquely proportioned 26-inch unit. Anyone who's spent quality time with the Dell 3007WFP will tell you that it's almost too big. So, we suspect the AL2616W could hit the sweet spot in terms of combining cinematic majesty with practical desktop usability. Our only complaint is the 1,920x1,200 native resolution. That's no more than your average 24-inch panel, meaning bigger, coarser pixels. And note: Acer says it will add HDCP support with an updated version at the end of the year.



## PREVIEW DIGITAL MP3 PLAYERS

Multimedia marvel

### ← Creative Zen V Plus 4GB

Price £180 Available Now Web [www.creative.com](http://www.creative.com)

Eighteen months or so ago, Creative's head honcho Sim Wong Hoo launched a \$100 million advertising assault on Apple's iPod with the following words: "The MP3 war has started and I am the one who has declared war... It's our target to beat iPod in this quarter." Since then, poor Mr Hoo has been dining richly on a diet of humble pie and over-ambitious words. The iPod hasn't been budged from its position of utter dominance atop the MP3 player market. And although we wish it were otherwise, odds are Creative's latest flash-based effort isn't going to change that. Nevertheless, the tiny new Zen V Plus offers features aplenty for iPod refuseniks to gloat over, including storage options up to 4GB, a 1.5-inch OLED colour screen, photo and video viewing, line-in encoding and a built-in FM radio. Impressive, but probably not enough to give Stevie J sleepless nights.

## Three alternatives...

### Apple iPod Nano

➔ Price £99 Available Now  
Web [www.apple.com/uk](http://www.apple.com/uk)

There's absolutely, positively nothing we can say about the Nano that hasn't already been said. So here's a couple of repeats: It breaks easily but it's still the best MP3 player around.



### Sony NW-E005

➔ Price £99 Available Now  
Web [www.sonystyle.co.uk](http://www.sonystyle.co.uk)

Techno-chic design is a welcome alternative to Apple's slavish adherence to black 'n' white minimalism. Nice piece of hardware, shame about the ghastly SonicStage software.



### Mcodey M-20

➔ Price £69 Available Now  
Web [www.advancedmp3players.co.uk](http://www.advancedmp3players.co.uk)

With a front fascia that presents a black nothingness when the unit is switched off, the Mcodey M-20 sticks Apple's minimalism in its pipe and smokes it. Seriously stylish.



## ANALYSIS

# NEXT-GEN PDAS THE CHIPS ARE DOWN



Back in June, Intel announced a deal to offload its struggling Communications and Applications Processor business (that's the division responsible for XScale PDA processors) for the relatively desultory sum of \$600 million.

In the context of the Santa Clara California-based chip giant's general strategy of belt-tightening and previous estimates of the division's total worth of around the \$10 billion mark, it was tempting to see the move as a sign of weakness, as evidence of how the Netburst Pentium 4 experiment had cost the company more than just market share in the desktop and server CPU sectors.

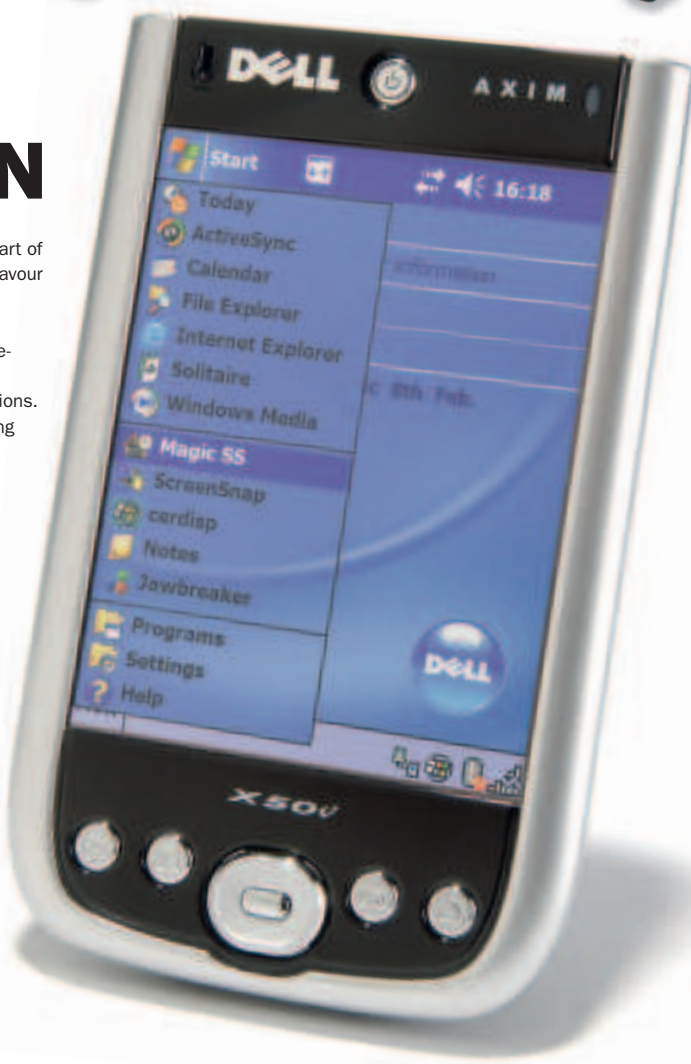
But that might not be the whole story. To understand why, we need to wind back the clock to August last year and to an announcement made by Intel grand fromage Paul Otellini. Specifically, Otellini told the throng of Intel faithful that the company's new focus on "performance per watt" would culminate in a 0.5W CPU capable of running Windows Vista by 2010. What's more, he revealed that the chip would be part of the same unified architecture to be implemented across every sector – that's desktop, server and mobile.

With that in mind, as well as Intel's previous commitment to ship a 1GHz XScale chip, an alternative interpretation of the XScale

division sale is obvious enough. It's all part of the plan to dump high-clocking CPUs in favour of cooler, more efficient designs.

Just imagine, a multi-core PDA and mobile proccie with a full desktop feature-set, including 64-bit data addressing, virtualisation and the latest SSE instructions. In short, a chip capable of natively running all your favourite desktop applications from high-definition video and gaming to full-scale productivity applications. Hell, if Apple won't build a PDA, how about a dual-booting model running both Vista and OSX? OK, perhaps that's a little far-fetched. But the more we see of Intel's new performance-per-watt drive, the more exciting its implications become. Intel has certainly had a desultory few years, so we're more than happy for it to carry on following its current, impressive comeback trail.

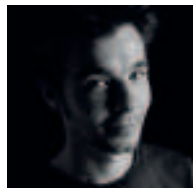
**PDAs with  
full desktop  
features?  
It's going  
to happen...**





## Gameslatest

THE FUTURE OF PC GAMING



**James Carey**  
HALF-ARSED COMPLETIST

**I've been ill, but the games keep getting better...**

Despite being riddled with nasty bugs (of both the software and meatspace varieties), I've enjoyed some fulfilling, exhilarating games this month.

But first off, while negotiating *The Cold From Hell*, I've had the sneaking suspicion that Starforce may have borked my DVD drive... I have no proof of this, and I'm not about to take the Russian Software Protection Racketeers up on their \$10,000 'prove it in our lab-environment' competition, but it does seem unusual that so many people can suffer the same symptoms without there being a connection – namely, my more-or-less new optical drive becoming slower and slower, then dying mere weeks after installing an SF-protected beta...

Bugs aside, the gaming horizon still sparkles with potential. A handful of exclusive betas have kept me busy and I rediscovered my love of indie games thanks to several awesome physics puzzlers (see *Armadillo Run* on page 104).

Finally, Europe has a game convention worth attending in Leipzig. As you read this, I shall be blogging goodies from said event – visit [blog.pcformat.co.uk](http://blog.pcformat.co.uk).



The new Hunters are advance guard for Striders.

## Half-Life 2: Episode Two

Free-form arenas and more Vortigaunt involvement promised for part two

**DUE DATE** Q2 2007  
**PUBLISHER** Valve  
**DEVELOPER** Valve  
**WEB** [www.steampowered.com](http://www.steampowered.com)

### Having already digested

*Half-Life 2: Episode One*, the hype begins for *Episode Two*... This time, Valve takes us out of City 17 and into Eastern European-style woodlands, hinting at more

the Combine command structure unravels and the humans try to reclaim their home. The Vortigaunts will taking a much more active role in the actual fighting this time, too. Better yet, *Episode 2* will ship with *Team Fortress 2* (see p12) and the groundbreaking environment-shifting puzzler

Surprising, given that it's only four hours long.

But even if you can shrug your way through that revelation, Valve's next move is even more astounding. A recent update on Steam declared that it had patched *Episode One* to make "a small balance change to the elevator battle... based on the stats gathered from people playing *Episode One*." What was this decision based on? Is Valve 'monitoring' how much ammo we're expending in-game?

It's interesting that one member of the PCF team stopped playing at the same

point. So, did a significant number of that 75% stop at the same point? Was that why Valve decided to make the change?

Next time you linger behind Alyx as she climbs some stairs, ask yourself: who's watching?

## "Only 25% of those who bought Episode One actually completed it"

"Battlefield-like" play which takes advantage of the new, open environments.

In fact, the whole story may be moving towards a total war over the Earth as

*Portal*, more news on which next month.

In other news from Valve, only 25% of those who bought *Half-Life 2: Episode One* completed it.



Will Alyx's final fate be revealed in *Episode Two*?



## GOSSIP!

"Star Trek has very adult themes of humanity... and personal drama..." – plus a Beatie lookalike with pointy ears. Legacy developer Mad Doc tries Trek high-brow angle. World laughs.





## Reclaiming the Holy LAN

*Dark Messiah of Might and Magic* wants you to sign up for its Crusade

**DUE DATE** September 06 **PUBLISHER** Ubisoft

**DEVELOPER** Kuju/Arkane **WEB** [www.ubi.com/UK/](http://www.ubi.com/UK/)

Multiplayer *Dark Messiah* – become the assassin you were born to be.

Ubisoft recently challenged PCF to a few rounds of multiplayer in a deconsecrated crypt, ostensibly to reveal the as-yet unseen Crusade mode, but we reckon Ubi was trying to put us off by surrounding us with corpses. It worked. The developers on hand from Kuju (taking care of multiplayer *Dark Messiah*) and Arkane (singleplayer) did a fine job of holding sundry journos at bay.

No wonder. MP *Dark Messiah* is a complex beast that takes some getting used to. Forget jumping in headfirst; instead, you must lock your enemies down and go into a thoughtful, circling dance of poised stances and timed parrying. PSone game *Bushido Blade* – famous for its realistic simulation of mêlée combat – was a big influence, says Kuju. But each class must learn to play to its strengths, be that holding back from the front line as a mage or priest, unleashing fiery death from afar, or sneaking about in the shadows picking off the unsuspecting as an assassin.

With Crusade mode, the longer you play, the harder your hero becomes. *BF2* Conquest-style maps are only the start, because all maps are linked. Win one and you move to the next front; lose and the fight returns to the previous map. The result? Real front lines over the course of a multiplayer session.

## in the pipeline

The future's not set, and neither are these game deadlines...

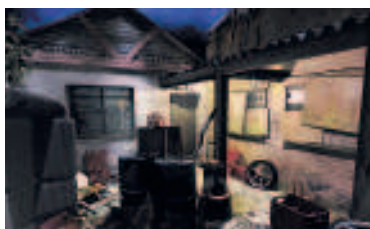
### OCTOBER

#### Silverfall

True photo-realism may still be some way off (just check out the corpse-like features of the models in *Oblivion*), but *Silverfall* has opted for something more trad anyway – a gorgeous, cel-shaded look. [www.deepsilver.co.uk](http://www.deepsilver.co.uk)

#### Barrow Hill

Forget Tony Robinson and his muddled attempts at making archaeology cool. All you need is an adventure set around an ancient burial mound in Cornwall. Set over one night, it's 24 meets *Time Team*. Sheer genius. [www.barrow-hill.co.uk](http://www.barrow-hill.co.uk)



#### Eragon

Based on the upcoming movie, itself spawned by a Christopher Paolini novel, comes the tender story of a young boy and his fire-breathing dragon. We're well up for some co-op dragon-fighting when this epic hits our screens. [www.eragongame.com](http://www.eragongame.com)

### NOVEMBER







## Beta eater

### Calling all barbarians-to-be and galaxy-ruling despots

We've been singing your praises to Elamaba, the creator of **Galaxylife**, a massive online universe that you can connect to via your PC, PDA or mobile, and our effusive praise has paid off. We've now secured keen Eaters beta-testing places for the minimal price of a simple email.

When we talk about persistent worlds, we're usually referring to worlds that exist on our computer – but with **Galaxylife**, said world really is persistent, ensuring that you can play on whatever device you have to hand, whenever you like. You start off with your own planet to rule as you see fit, but build it up enough and one day you could rule the entire galaxy...

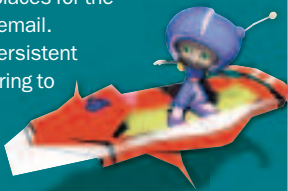
Don't forget that there's still a chance to get yourself on the beta test for the barbarism of **Age of Conan – Hyborian Adventures**. All you've got to do is answer the question below and send your answer, together with your beta-test of choice, to [betaeater@futurenet.co.uk](mailto:betaeater@futurenet.co.uk).

#### What's the common name of our galaxy?

a) The Milky Bar b) The Milky Way c) The Milky Milky



Note to self: clean car, walk dog, take over galaxy...



## Sheepskin sim

**DUE DATE** Autumn  
**PUBLISHER** Codemasters  
**DEVELOPER** Codemasters  
**WEB** [www.codemasters.co.uk](http://www.codemasters.co.uk)

### Football management

games have a long and successful history on the PC. Back when *Elite* was considered the very apogee of graphical flair, erstwhile publisher Eidos begat *Championship Manager*, which in turn begat *Football Manager*, and fans of the stat-loaded spreadsheet-athon saw that it was good.

And lo, it came to pass that football management games embraced '3D' match engines, animation and other such heretical frippery. *LMA Manager* has been capitalising on this since 2003, and thus, two factions formed: those who clung nostalgically to *Football Manager's* purist, dry approach, and those who liked to watch Cristiano Ronaldo being thrown contemptuously to the ground by John Terry.

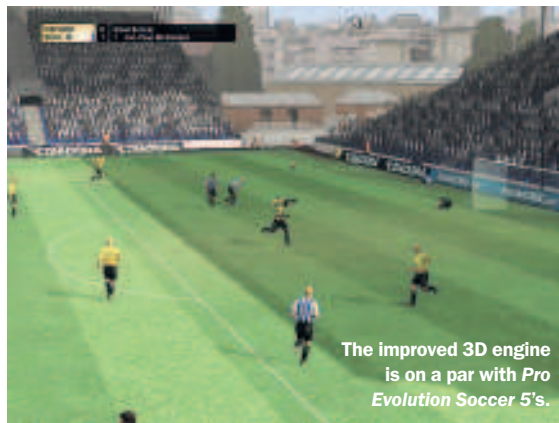
Now *LMA* is back, just in time for the new season. This time around, the 3D

match engine looks almost as good as *Pro Evo 5's*. Entirely new functions are admittedly thin on the ground at present, but we especially liked the option to 'design' your in-game avatar; yes, you too can make your on-screen equivalent look just like *PCF's* Editor Adam (if you so wish). This superficial element of the game actually adds a great deal of fun to proceedings. There's also the useful option to found your own club and watch it gallop merrily up the leagues if

you don't fancy taking over an established side.

We couldn't help thinking, though, that *LMA 2007's* improvements, while welcome, mask a lack of genuine new features. That said, fans of the franchise are once again well-served by this edition (which is still quite a way from being finished at present) and you can expect a full review as soon as the final version of the game hits the back of our mailbox.

Fear not, though – from our vantage point, *LMA* is clearly in safe hands.



The improved 3D engine is on a par with *Pro Evolution Soccer 5's*.

### EverQuest 2: Echoes of Faydwer

In a world where MMO expansion packs are seen exclusively as the domain of the über-dedicated, fully levelled-up fans, it's refreshing to see the new *EQ2* pack offering content for all levels of player from one to 70. [www.everquest2.com](http://www.everquest2.com)

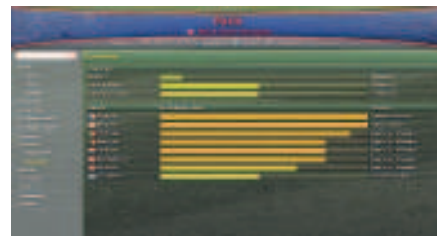


AUTUMN



### Need for Speed: Carbon

In a bid to smash the 'dull Canadian' stereotype, Vancouver-based EA Black Box is taking the *NFS* franchise to the hills. Hairpin turns should make for some skidmark-inducing slides, and we ain't talking burning rubber... [www.needforspeed.com](http://www.needforspeed.com)



### Football Manager 2007

Sports Interactive will please many a fan when its annual update to the best footie management game ever is released. At long last, the feature requested since time immemorial – the provision of feeder clubs – is being introduced. [www.footballmanager.net](http://www.footballmanager.net)

NOVEMBER



# While the cat's away...

God's gone deaf-blind and we're in an *Infernal* pickle

**DUE DATE** October **PUBLISHER** Playlogic  
**DEVELOPER** Metropolis **WEB** [www.playlogicgames.com](http://www.playlogicgames.com)

**T**he eternal battle between good and evil has been the basis of all the best stories since the world was in its metaphorical nappies. *Infernal* is no different, except that its almost unique perspective puts you in a 'Wait a minute. Aren't we the baddies?' mindset.

Like that weird-fest movie *Night Watch*, the game contends that there are two Earth-bound agencies working to maintain the balance between heaven and hell. Every 1,000 years, a freak astrological event temporarily renders the Almighty deaf-blind. During this period, the forces of light go on the offensive, your character sides with El Diablo in exchange for some nifty powers and the game kicks off.

Cue paranoid, third-person shooty action, with some vehicle-based fun thrown in. And Metropolis has been cute with the extra feats your character can perform – there's a three-step, out-of-body teleportation that enables you to spawn behind enemies or access tricky-to-reach switches, for instance, and *Half-Life 2*-style gravity gloves.

Particularly interesting is the in-game AI, which sees the enemy scouring the map every second, checking the location of friend and foe, and any cover in the vicinity. They even react to actions you perform, screaming about 'some infernal gun' you're using, or peppering your cover point with fire should a stray round give away your location. Hopefully, such devilry will help give *Infernal* an edge over its rivals...



## Pro Evolution Soccer 6

It's coming up to that time of year again: the footie update season is upon us. New licences, new players, some incredible character animation – and the ability to actually score – should make this update the best ever. As usual.  
[www.konami-europe.com/games](http://www.konami-europe.com/games)

## DECEMBER

### XIII Century

According to publisher 1C, some of the devs on this serious challenger to *Medieval 2: Total War* are crazy for the detail. As such, you can expect meticulously recreated historical wars, characters and even battlefields. [int.games.1c.ru/13\\_](http://int.games.1c.ru/13_)



### Wings over Europe

Budget champion Xplosiv is releasing this mod-friendly Cold War-era flight sim on its Premium £20 range. The game architecture has been especially laid open for the mod community to come in and create new aircraft, missions and terrain. [www.xplosiv.net](http://www.xplosiv.net)



# Guild Wars: Nightfall

Third time's a charm

**DUE DATE** TBC **PUBLISHER** NCSoft  
**DEVELOPER** Arenanet **WEB** [www.ncsoft.com](http://www.ncsoft.com)

**A**ll the best stories come in a trilogy and now the saga which began with *Guild Wars: Prophecies* (the full install of which you'll find in on this month's bonus disc), and continued with *Factions*, comes to a close in *Nightfall*. That's not to say this is the last chapter of *Guild Wars*, just the culmination of the Titans/Shiro story arc.

*Nightfall* is still a standalone campaign, so you won't need the other games to enjoy it. It takes place on a new continent called Elona, with links back to Tyria and Cantha, so you can bring your old characters across if you like. The new world has a distinctly African theme, too, running from Egypt-like finery to tribal plains, all with a suitably fantastical bent, of course. Deserts dotted with bleached-bone behemoths await all intrepid adventurers.

Arenanet has sensibly overhauled the original game's less-than-perfect henchmen system. You now have NPC allies instead, to whom you can issue specific orders during a fight, using player-dictated skills, spells and weapons, as and when you think it necessary. More interesting still is the new branching quest structure. There are now stark choices to make which affect how your own story progresses within the new continent of Elona. This should please critics of the earlier incarnations, who considered the original gameplay a little too prescribed for comfort. If you activate the *Guild Wars* trial on this month's disc over the weekend of September 1st, you'll can sample *Nightfall*'s PVE for yourself.



## Take her for a whirl

This is the new Dervish class. Use the priestess's deadly scythe-swinging skills to attack many targets at once.

## Gods & Heroes: Rome Rising

So what if *Titan Quest* is just like *Diablo*? The lead designer behind *Diablo 2*, Stieg Hedlund, has designed this fantasy Roman MMO, and we can't wait to fulfil all our *Clash of the Titans* dreams and take down the Medusa. [www.godsandheroes.com](http://www.godsandheroes.com)



WINTER

## SPRING 2007

### Death to Spies

To all intents and purposes, this is where Agent 47 cut his teeth. It's a *Hitman*-esque WW2 stealth-fest where you get to complete each mission in your own 'special' way. Nazi-culling ahoy, then... [int.games.1c.ru/death\\_to\\_spies](http://int.games.1c.ru/death_to_spies)



### Diver: Deep Water Adventure

You just can't mess with a game that, even before its release, wins no less than *Playboy Russia*'s game of the month. Created by divers as opposed to programmers, we're talking more sim than swim here. [www.diver3d.com](http://www.diver3d.com)

2007





## National guard

This is the new Paragon class. Guardians of Elona, they are chosen by the gods to defend the Elonian people against all threats, foreign and domestic. They're spear-wielding warriors with a head for command. Think Battle Priest with excellent minion benefits.



## The Highlands of Elona

The very un-Scottish Highland area of *Nightfall*. It looks like some sort of art deco North African metropolis. Either that or the latest casino on the Vegas strip.



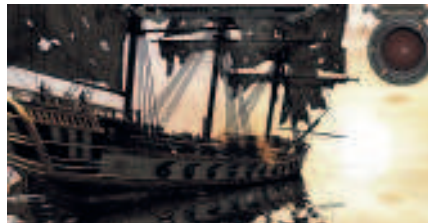
## The Hanging Gardens

Distinctly Babylonian in theme, the lush interior gardens offer a cool respite from the hostile surrounding desert, giving you time to prepare for the next part of your journey...



## Shadow of Aten

Should the worst happen and Indy can't find his way onto our beloved PC, then we may well have a ready-made equivalent in the redoubtable Allan Scott, an ex-British serviceman braving the perils of 1930s Egypt, replete with monsters and Nazis. [www.theshadowofaten.com](http://www.theshadowofaten.com)



## East India Company

Trading on the high seas is what this sumptuous Finnish title is all about. Be ye pirate, trader or soldier, you've got to negotiate the waters from London to Aceh and all that's in between. That's a whole lot of water to explore... [www.eicgame.com](http://www.eicgame.com)

## TBC

### A Vampyr Story

Time for adventure fans to get excited once more. After looking like it was getting canned earlier in the year, *A Vampyr Story* now has another publisher and is back on track – and with much of its team made from ex-LucasArts folk, promisingly. [www.amegames.com/vs](http://www.amegames.com/vs)



SUMMER 2008





**Jim Rossignol**  
SPYING SCIENCE

# Watchthisspace

**THE FUTURE IS HERE. JIM ROSSIGNOL POWERS UP**

## Energy in the UK

As the energy crisis deepens, the project to create cheap power heats up

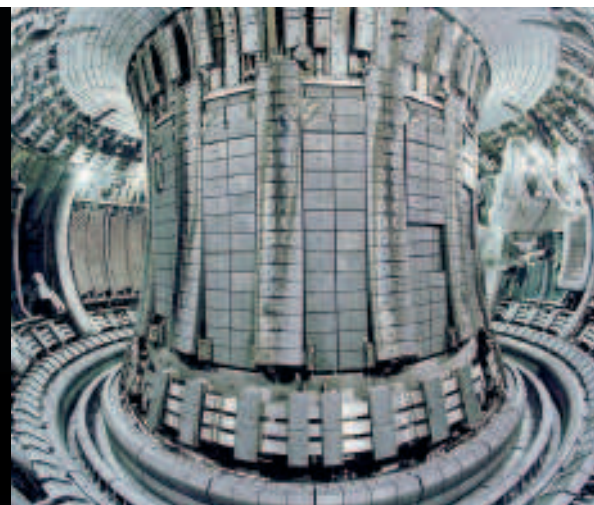
**F**usion reactors may look like devices from a futurist fantasy, but that doesn't mean that they're science fiction – in fact billions of dollars are being poured into creating the prototypes that could one day provide the Earth with limitless electricity. The holy grail of the international energy crisis could arrive by 2050.

That sounds like a long time to wait, but its potential still outweighs any alternative options. Coal and gas are running out, and as commendable as wind and solar power are, they're still relatively expensive and inefficient. Fusion power, once mastered, will

produce electricity using the same processes that power the Sun, cleanly, and without all the dangerous waste generated by its little brother, nuclear power.

The world's only working fusion reactor (pictured) is in Culham in Oxfordshire, but even this is only a crude sketch of what will be required to power your PC in latter half of the 21st century. The Culham reactor can only run the plasma reactions required to create fusion for a few seconds, and a commercial reactor will need to run these reactions for *decades at a time*, while also being able to withstand the massive

The UK's JET reactor is one of the most advanced scientific instruments in the world.



bombardment of neutrons that a fusion reaction unleashes. The next step is a major new prototype, to be built in France, which will be based on data gathered at Culham.

The Engineering And Physical Science's Council reports that there are now 35 students studying plasma physics and the relevant materials science in the UK. The fate of fusion, and of the power crisis as a whole, lies with them. [www.jet.efda.org](http://www.jet.efda.org)

## Bulletproof liquid?

**T**he Army Research Laboratory in Aberdeen, Maryland, has developed a new technology that could soon result in flexible 'liquid' armour, which will augment the protective capabilities of traditional kevlar suits. The 'sheer thickening fluid' stiffens when struck, allowing it to absorb huge impacts and distribute their energy over a larger area than solid armour. This should save more troops from gunfire, but still offers no real protection from the shockwave effect of roadside bombs and other dangers. [www.arl.army.mil](http://www.arl.army.mil)

**This month in Science**  
**August, 1890**

Murderer William Kemmler was the first person to be killed using the electric chair on August 6th 1890. Kemmler had to be electrocuted twice, in a grotesque process taking several minutes.

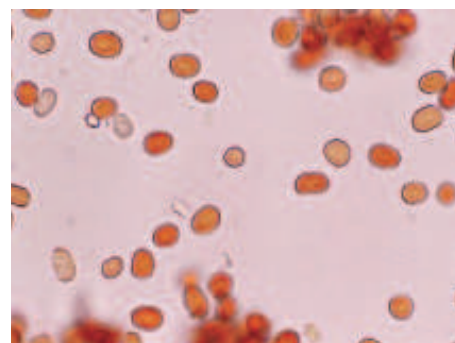
## Bugs from space

Back in 2001, mysterious red rain fell on India. Could it have been aliens?

**K**erala in India is currently the focus of intense scrutiny as researchers struggle to identify the 50 tons of red matter that showered across the state between July and September 2001. The materials found in the rain showers have been identified as biological cell-like structures, but they do not contain DNA. As DNA is essential to all life on Earth, its absence suggests that their origin may not have been a terrestrial one

Dr Louis Godfrey of Mahatma Ghandi University in Kerala has speculated that since these particles do not conform to any known biological materials, that they could in fact be extraterrestrial life of some kind. He offers the explanation that the red particles could have been frozen into a comet which crashed into the atmosphere, melted on its way down and eventually fell as rain across Kerala. British scientists have suggested that the material may simply be an anomaly, and that the absence of DNA might not make the particles extra-terrestrial in origin. The investigation continues as labs around the world conduct independent tests on the mysterious red cells.

[education.vsnl.com/godfrey](http://education.vsnl.com/godfrey)



Could these red particles be alien microbes?

## THE BEST FOREIGN SNACK SITES

### Cybercandy

[www.cybercandy.co.uk](http://www.cybercandy.co.uk)

The universal sweetshop, Cybercandy, sells confectionary and drinks from more than eight different countries, including Japan, the US, China and Canada, and recently a new European section. Now you can finally get that Raspberry Coke!



### Snack Spot

[www.snackspot.org.uk](http://www.snackspot.org.uk)

Offering more of an information resource, Snack Spot's community reports sightings of any rare or obscure sweets and snacks so the keen snack-hunter can pounce. Astonishing ranges of food and drink covered.

### Sanza Shop

[www.sanza.co.uk](http://www.sanza.co.uk)

Sanza is a site aimed at Safas, Kiwis and Aussies living in the UK, and the shop aims to sell the products such antipodeans may be missing. It also has community info and chatrooms for you down-under types.

### African Enterprises

[www.africanenterprises.com](http://www.africanenterprises.com)

Boasts specialist South African produce, so fans of biltong, SA's renowned dried meat snack, should head to this site forthwith and stock up.

# The web pages

## THIS MONTH'S ONLINE HAPPENINGS



## Digital discrepancies

### Defeat For Net Neutrality only means further legal wranglings

**T**he Net Neutrality Bill, lobbied for by many massive internet companies, has been rejected by the US House of Representatives. The Bill, aimed at stopping the telecoms companies from charging for tiered broadband services, was voted out by a 269-152 majority.

It was always going to be an interesting battle, as reported by *The Web Pages* a few months back. With companies like Google, Amazon and eBay on one side, it would normally seem a foregone conclusion. But when the opponents were the giants of telephones such as AT&T and Verizon – those in control of the cables along which the net communicates – it was suddenly less cut and dried. Unsurprisingly, the issue split evenly between Republicans and Democrats. The Republicans mostly voted against the Bill, while the Democrats gave their support to internet-based firms.

The Bill was intended to protect equality among websites, such as all must be treated the same by the



### Calcium delivery

#### MILK FLOAT CORNER

Someone has seen fit to compile and answer FAQs about milk floats. Which means, officially, the internet has now covered all subjects in existence! Congratulations, the internet.

Milk Float Corner is a site dedicated to chronicling these electric beasts of the dawn, while providing invaluable information such as: why are they called 'floats'? Well, we'll tell you: no one knows. Which is rather more interesting than knowing. Milk float: the enigmatic milk delivery machine.

Founded by Dave Root and managed by Tim Fardell, the site contains all the milk float info you could ever want, as well as pictures of the very latest designs, and best of all, incidents of milk floats appearing in *The Arts*, from music (don't sing it) to film to poetry.

[www.milkfloats.org.uk](http://www.milkfloats.org.uk)



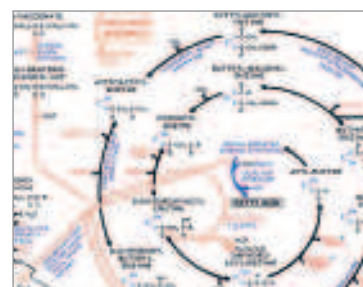
### Little Brother

#### NNDB

"Tracking the entire world" is quite a bold claim. And also the stuff of terrifying movies and news stories about leaks from the CIA. NNDB (National Name Database) describes itself as "an intelligence aggregator that tracks the activities of people we have determined to be noteworthy, both living and dead". It intends to demonstrate the links between individuals, and currently has over 18,500 profiles.

With links to Rotten.com's library of profiles, and its own Who's Who-alike information, it's impressive. Want to know what nickname George W Bush gave US Whitehouse political advisor Karl Rove? (either Boy Genius, or disturbingly, Turd Blossom), or how many heart attacks Rick Wakeman has had? (Three.) It's all there. Spooks, eh? Pshaw.

[www.nnbd.com](http://www.nnbd.com)



### Protein shake

#### EXPASY

"The Expert Protein Analysis System (ExPASy) proteomics server of the Swiss Institute of Bioinformatics (SIB) is dedicated to the analysis of protein sequences and structures as well as 2-D PAGE (Disclaimer/References)." Hmm.

The page of this intensely detailed site to which we wish to draw your attention is the map of biochemical to metabolic pathways. Why? Because it is deeply beautiful to stare at.

The chart is made up of 120 sections, each showing the chemical reactions taking place in the conversion of enzymes, the processes by which enzymes are synthesised from DNA, and the enormously complex formulae in which our bodies are constantly engaged.

[www.expasy.org/cgi-bin/show\\_thumbnails.pl](http://www.expasy.org/cgi-bin/show_thumbnails.pl)



telecommunications companies. Opposing the Communications Opportunity, Promotion, and Enhancement, or COPE, act it was hoped to prevent suppliers from charging more to certain sites. COPE supporters wished to create a system whereby they could set up a "fast lane" for bandwidth-intensive sites.

## THE FIGHT CONTINUES

These things never end simply, though, and defeat at the battle of the House of Representatives does not mean the war is over. The debate has now moved back to the Senate Commerce Committee, as Net Neutrality continues to be the thorn in the side of a more wide-reaching communications bill that bounces back and forth through the various stages of red tape. The Consumer's Choice and Broadband Deployment Act is a re-writing of US communication laws, designed to update the law for video, satellite and broadband communications, and new copyright and DRM rulings. There are many other contentious sections beyond the Net Neutrality, including giving the FCC the ability to make it illegal to home-record digital radio, and new restrictions on recording digital TV.

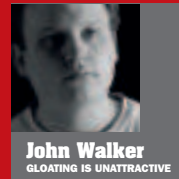
If anything, the major sticking point of the broadband regulations is a saving grace for those opposing the

new copyright rules, which will also make it extremely difficult for online radio stations to continue broadcasting. A version of the Bill with the Net Neutrality section omitted is currently being scrutinised in the United States Senate, with the Bill's backers hoping it will at least allow the machinations to begin, for a bill that is will take many years to be fully realised, with impending implications for how the rest of the world will receive its digital content. **PCF**

**"Companies want to set up a 'fast lane' for bandwidth-intensive sites"**



**Blogline**  
**Harry's Place**  
One of the most intelligent and considered left-wing blogs around, which delights in chasing hypocrisy from all political agendas. Never better than when growling at George Galloway's antics.  
[hurryupharry.bloghouse.net](http://hurryupharry.bloghouse.net)



# Copyright watch

**John Walker** watches patiently from the sidelines, as the copyright enforcers self-destruct

**Y**ou'd be forgiven for thinking that this month's column should concern itself with the actions of the Swedish police. They have seized the servers of filesharing site Pirate Bay, and grabbed the data of local business and private sites located on the same machines at the same time. Pirate Bay was up and running days later on Dutch servers, but the rest of the companies and sites were left down, without compensation. Pirate Bay, of course, was working within the letter of Swedish law, making the raid utterly without merit. But we're not talking about that.

And we're also not talking about the Section 115 Reform Act of 2006, currently sliding under US Congress' carpets. The Bill that almost no one has noticed, apart from [ipaction.org](http://ipaction.org), will require that "all incidental copies of music to be licensed separately from the originating copy," including, astonishingly, songs cached in your computer's memory, or those within the buffer of an online

stream. In other words, it wants to charge you twice as much for listening to something you've already bought. It is, as IP Action points out, a new market for which we can be charged, or more likely sued.

Nope, this month the column will draw your attention to Neo-Patronage. [www.anothersky.org](http://www.anothersky.org) presents the genuinely world-changing proposition of re-assessing the motivations for creating art. It doesn't abandon the commercial incentive, but establishing once again the notion that patrons pay artists for their art, and nothing more complicated need exist. It is "an honour and trust-based system of financial support for an artist that comes from the artist's collective audience, rather than a single individual or organisation." This is the future for the creation and dissemination of art, and it will be the system that remains after the corporate implosion is complete.

*Note – the opinions expressed in Copyright Watch do not necessarily reflect those of PCFormat.*

**Can musicians rely on the milk of human kindness for survival?**



Picture Chris Garbutt

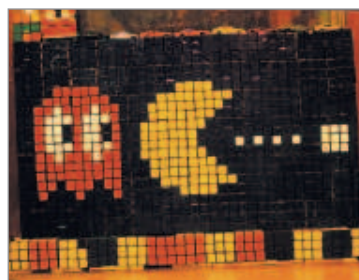


## Holy smoke JESUS PAN

We live in an instant fix society, with everything immediately available or otherwise unwanted. Fast food, faster broadband, one-hour film processing, instant travel teleportation machines and so on. But if there's one thing that's proved hard to efficiently streamline, it's deities. For millions of years (or only six thousand depending on your god) they've become used to their own leisurely pace, but really it's not good enough.

Thankfully, now you can have your miraculous apparitions on demand! That's right – with Jesus Pan, the face of your Lord can appear in whatever you might be cooking, in a matter of seconds. The Jesus Pan is ideal for seeing the face of Christ in every toasted sandwich, fried egg and pancake you consume. Buy one today!

[www.jesuspan.com](http://www.jesuspan.com)



## Square RUBIK'S CUBE ART

If you're anything like us, you'll be the bright sort who could solve an Rubik's Cube within a matter of seconds due to your innovative, outside-the-box thinking. That's right – we'd peel the stickers off and stick them back on in the correct pattern. This is why we're the high-flying *PCFormat* writers of the day.

However there are others who still think it's clever to complete the buggers by spending hours and hours aimlessly twisting at the stupid thing, trying to figure out how to get that one red corner off the blue face, and then throwing it at the wall. A far better use of the things is *art*. And that's what we have here. By 'solving' cubes to have a pattern on one face, and then stacking many of them together, fantastic mosaic patterns are possible, as proved Jacob Davenport and Andrew Looney.

[snipurl.com/rv3i](http://snipurl.com/rv3i)

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- ☐ Splinter Cell Chaos Theory ☐ Brothers in Arms: Earned in Blood  
☐ Everquest II We only have limited stocks of 33 of each game

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## PCFMail



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EASY WAY!  
SUBSCRIBE ON PAGE 134

## DISCUSS HOT TOPICS AT [forum.pcformat.co.uk](http://forum.pcformat.co.uk)

### Box clever

I very much enjoyed reading your 65 Greatest PC Moments feature, but you certainly left out one very important moment – the death of the beige box! Surely the most important contribution to PCs being widely accepted, and, dare I say it, desirable, was from that first manufacturer that realised that beige goes a horribly scummy colour after extended use.

Not only that, but Google at number one? If we're going to bow to

our multinational overlords, how about giving Microsoft the top spot? It may be an unfashionable move to give that particular company credit, but you can't deny it makes almost everything we do on our PCs possible.

**GERALD PAYNE  
HIGH WYCOMBE**

**PCF says** Glad you enjoyed the feature;



### Online gamer

I was wondering, there's a great selection of budget/cheap games on offer these days that are often great value. However, when I buy a game, I am interested in two things. One is do I need to patch this to get it to work on the latest hardware and drivers? The second factor that interests me is whether or not I can play a prospective purchase online. Is the company which provided the online servers still maintaining them? Is there an alternate server to connect to?

This led me to another thought: how difficult is it to set up a VPN between friends over the internet?

**JOHN  
acr13c4@yahoo.com**

**PCF says** We're big fans of Hamachi ([www.hamachi.cc](http://www.hamachi.cc)), which will allow you and like-minded chums to create a virtual LAN across the internet in a couple of hassle-free minutes. This neatly hops over the problem of dead servers. As for patching, many budget games are released fully patched up to the latest (usually final) version. As for titles that have just dropped in price, most updates remain on big download sites such as Fileplanet.

### No laughs please

First of all, I like to read your magazine. The reason I'm writing to you is because of the way you like to insert 'funny' and 'witty' one-liners as your way of giving a story or topic a sub-title. PLEASE!!! I have not chuckled once at any of your attempts at humour or wit. Please stop the lameness. Do you just pull out your Pocket Webster's Thesaurus of One-Liners and use the first thing you find to use as a caption to an image or as a title for a story? Please quit or at least update your thesaurus (one published after 1970 would help). Yes, I'm writing from America. Thanks and I look forward to reading your soon to be funny magazine!

**CHRIS MAST  
chrism1367@comcast.net**

**PCF says** All our one-liners are post-post-ironic. Expect a bit of toilet humour next month. Oh, and since we recently lost our well-thumbed 1969 edition of the Pocket Webster's Thesaurus of Put-downs, could we borrow yours?

## Mail of the month

Following a recent purchase of the August edition of PCFormat, I come across an article about people being able to download a beta version of Vista for free. I tried to download the software on the same day as your magazine hit the shelves. I visited the link,

also prints the official Microsoft XP Magazine – it's bound to obtain the software well before your readers. Well PCF, I'd love to know how I can get Vista with a product key?

**CHE BRAMLEY  
che.bramley@ntlworld.com**

**PCF Says:** The bad news is that between the time of the magazine going to press and it arriving in the shops, Microsoft withdrew the download. The good news is that Vista Release Candidate 1 will materialise soon, and if we can covermount it, we will. Have a USB memory drive to help make the wait pass just a little bit quicker.

only to be told that all product keys and customer participation program had been closed.

I emailed Microsoft and I was referred to Microsoft UK. I called them, and the advisor told me that a beta version is not available for UK customers, due to regional variations in the software. The moral of your article seems to be 'yes we'll tell you about something, but you won't be able to download it,' which makes me wonder how you obtained it in the first place? Oh, hang on, Future Publishing

**OVER TO YOU**  
What were PCF readers' gaming milestones?  
Turn to p146 to find out

as for the demise of the much-maligned beige box, we've blanked that horrible era out of our memory completely, along with the lion's share of the 1980s.

### Heated debate

Regarding Keith Moore's letter of the month back in issue 190, I can't help but disagree. His assertion that OSX running on a PC would be unsuitable material for a PC magazine to cover seems wide of the mark to me. Surely now that Macs have Intel chips, they are PCs? If Mr Moore would like a PC that runs OSX, then perhaps he should consider picking up a MacBook? After all, his experience of PC use wouldn't be limited but expanded. I ask, if the technology is the same, and it's only the software that is different, what makes an Intel Mac anything but the kind of PC that Mr Moore describes when he says PCF is not WindowsFormat?

I for one think that as Macs become the PCs they deserve to be, rather than an platform ostracised for the sake of it, you should be increasing your coverage rather than maintaining the old divide.

**MARIA CHURCH  
RIPON**

**PCF says** It's a tough one, and is sure to cause ructions for a good while yet. The general consensus is that the Intel Macs offer more of the 'lifestyle' elements than a standard PC (with smarter aesthetic design and effortless dual-booting) but less of the nitty gritty stuff like upgrading. How you perceive and use your own PC is bound to have a bearing on what you think of Apple's machines.



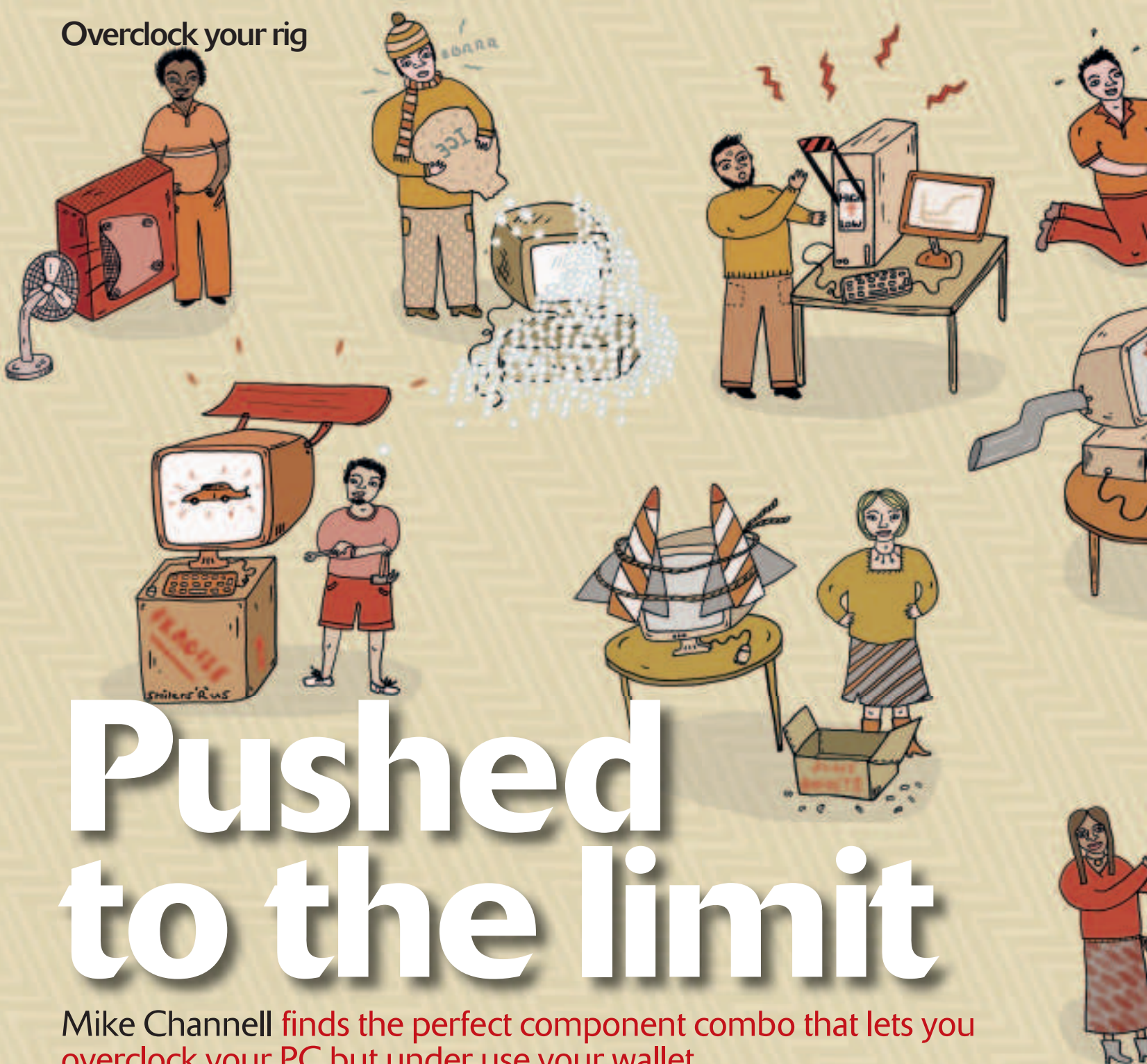
### Mail in and win

We've teamed up with ace memory supplier Crucial, [www.crucial.com/uk](http://www.crucial.com/uk), to give the author of our letter of the month a fantastic 512MB Gizmo! USB memory drive worth over £30. It works flawlessly with every version of Windows after Me.

You can air your views and write to the team at PCF Mail, PCFormat, 30 Monmouth Street, Bath, BA1 2BW, or via email at the address below. Or you can visit our forum at [forum.pcformat.co.uk](http://forum.pcformat.co.uk).

**pcfmail@futurenet.co.uk**

Overclock your rig



# Pushed to the limit

Mike Channell finds the perfect component combo that lets you overclock your PC but under use your wallet...

**T**here are some smells you simply don't associate with computing, particularly food-related ones. When was the last time you were diligently posted at your desktop and the smell of sweet summer fruit wafted past your nostrils? The seemingly unlikely fragrance of cabbage, on the other hand, is now on our list of whiffs to expect (if not wish for) when computing. This is because boiled cabbage, as AI unfortunately found out recently, is the unique aroma of a CPU converting itself into a useless puddle of slag.

This experience encapsulates the fear surrounding overclocking. 99% of PC users have no intention

of fiddling with components that work perfectly well, fearing the computing equivalent of *The Towering Inferno*. But as we've learned from history's pioneers, overcoming the fear can reap great

**"By the end of this feature, you'll have the knowledge and confidence to overclock a PC"**

rewards. If Sir Edmund Hillary had been content just to scale the hill to the local post office, rather than the infinitely more terrifying task of shinning up Everest, he wouldn't enjoy the privilege of seeing his own face every time he takes a fiver out

of his wallet in his native New Zealand. While we can't promise that you'll shunt Elizabeth Fry from the face of our own glorious currency simply through overclocking prowess, overcoming your inherent

terror of destroying components can offer a considerably speedier computing experience.

## **CLOCKING ON**

Depending on which bits and bobs you start off with, straining

components as close as you can to breaking point can generate astronomical performance gains, and we aim to prove that with a bit of tweaking know-how you can actually save a considerable amount of money against equivalent-performing off-the-shelf kit. Why buy a £150 processor when you can put a bomb under an £80 CPU and garner the same performance? That's why we've decided to pick the best kit to get the maximum performance leap for the smallest possible outlay.

As you can see from our little shopping list to the right, we've hardly spent a king's ransom, considering we have the essentials





Picture © Mel Croft

for a reasonable PC there. But 'reasonable' is the reserve of dullards, and we're going to whip that little lot into a finely tuned, game-devouring behemoth. We'll also be providing solid benchmarks from the PCF test bed to show you exactly where we've blown the 'on paper' spec out of the water.

## TUNER CULTURE

We've decided to ignore extraneous periphery like monitors, keyboards and mice in this guide, simply because they can't be fiddled with. While these are essentials for a new PC, if you're hardened enough to squeeze every last drop from your gaming machine, we'd imagine you

already have a preferred peripheral set up that fits the contours of your body like a glove. We're just focusing on the bare essentials that can be coerced into punching well above their weight.

Worry not, though. By the end of this tutorial you'll have both the knowledge and the confidence to dig around in those BIOS menus looking for an obscure setting that will unlock an extra ounce of grunt. Best of all, you'll have the skills required to create a PC that truly is a wolf in sheep's clothing. Before you start cranking up the voltage though, be sure to check our golden rules, lest the smell of cabbage should rear its ugly head once more...

## WHAT WILL TORTURING MY PC COST?

Our shopping list of highly overclockable computer bits

### 2.66GHz Pentium D 805+ £82

[www.aria.co.uk](http://www.aria.co.uk)

Only a 533MHz FSB, but don't be fooled, we're going to wring out every last drop of power.



### Sapphire Radeon X1800GTO £121

[shop.cs-o.co.uk](http://shop.cs-o.co.uk)

By no means a top of the range card, but we have some rather elaborate plans for it.



### Corsair XMS2 1GB TwinX RAM £118

[www.chillblast.com](http://www.chillblast.com)

Two 512MB sticks of tweakable RAM that we'll be taking to the limit of performance.



### Asus P5w DH Deluxe £143

[www.asus.com](http://www.asus.com)

Lots of headroom, but you can get the same results from a cheaper board.

### Zalman Fatal1ty FS-C77 £37

[www.pcgiant.co.uk](http://www.pcgiant.co.uk)

Check out this impressive cooler in our feature on p44. It even gives some watercooling kits a kicking.

**TOTAL**  
**£501**

## THE GOLDEN RULES

Avoid setting your rig on fire with our simple safety checklist

## DON'T

>> **Blame us if it all goes horribly wrong.** Overclocking is, by nature, taking components beyond their recommended performance level. As a result, any overclocking you do, you do at your own risk. Sorry, we'd love to be more supportive but them's the (legal) breaks.



>> **Be afraid.** It is mightily scary taking those first steps toward upping performance, but if you never try it you'll never know if there's a few extra MHz that can be juiced out of your kit. Of course, choosing kit like the Pentium D, which is ridiculously easy to take beyond its limits, does help fend off the terror.

>> **Expect all parts to be created equal.** Not everything will overclock to the same level – if you're buying components with the expressed intention of overclocking, float around some forums and see if you can get a handle on their capabilities.

## DO

>> **Make changes incrementally.** There's no point in whacking your CPU frequency up to 400 and your voltage up to 2V and hoping it will survive. Make baby steps, otherwise you may end up frying your components and being left with a pile of smoking silicon.



>> **Change one thing at a time.** You're more likely to identify a sticking point if you're only changing one variable at a time. If you've changed CPU frequency, RAM timings and your GPU all in one fell swoop, when your PC staunchly refuses to boot, how will you know what's gone belly up?

>> **Test your changes thoroughly.** While your PC may boot up at 5THz with the RAM running at 4GHz (good luck with that one) it may be hideously unstable. Run a few of your favourite benchmarks, getting the CPU up to full load for an extended period to ensure changes have stuck.

## CPU

Be prepared for some staggering gains as we take a budget CPU to the very limits of its capability

**T**he most obvious target for overclocking is the CPU. As the core of your system, any gains made here will affect not only performance, but also processes like video encoding.

Buying a new CPU with the explicit intention of overclocking is a risky business, though, as mileage

dual core chip with two major advantages. Firstly, it's got an extremely low base frequency and an extremely high multiplier. The combination of the base frequency and the multiplier creates the final running speed – so in its stock configuration it runs at a frequency of 133MHz multiplied by 20,

**“As the CPU is the core of your system, any gains made here will greatly affect performance”**

per chip varies wildly across the range. Luckily we've found a chip that we, and the swathes of hardcore overclockers on the net, feel is the most overclockable processor for a very long time. The star of this particular show is the Intel Pentium D 2.66GHz 805. It's a

creating the 2.66GHz Intel slaps on the retail box. Of course, this means that if you up the frequency, every change is multiplied by a factor of 20, meaning big performance gains. The other advantage is, of course, the price – well under £100.



## Hard core

Learn your timings tables

The table below shows you the resultant frequencies gained by upping the base frequency. As you can see, a relatively meagre increase of 33MHz on the standard base frequency shunts the resultant frequency from 2.66GHz to 3.33GHz. Of course,

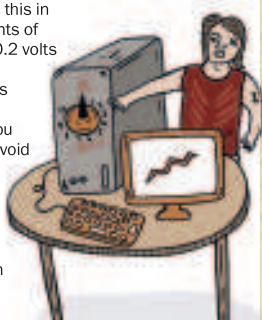
the target is to push the chip over the 4GHz barrier, which would require the base frequency to be lifted to a rather power-hungry 205MHz. We'll explain how this quasi-mythical figure can be attained and maintained later on.

CORE FREQUENCY	MULTIPLIER	FINAL FREQUENCY
133MHz (stock)	x20	2.66GHz
140MHz	x20	2.86GHz
150MHz	x20	3GHz
200MHz	x20	4GHz
205MHz	x20	4.1GHz

## VOLT FACE

Turn up the juice

Sooner or later during your climb up the overclocking ziggerat, you'll run out of power to support the upped clockspeeds. At that point, you need to alter the voltage of your core to give it the extra oomph it needs. There should be an option in your BIOS to alter the CPU VCore voltage. If you increase this in increments of around 0.2 volts until the system is running stable you should avoid sending that chip on a one way trip to silicon heaven.



## Chips challenged

How to take your processor beyond its limits



**1** CPU settings are accessed via the BIOS. Boot up your PC and hit [Delete] to access this rudimentary set of screens built into your motherboard. Depending on your board, you may have a dedicated overclocking suite within the BIOS. If not, you may have to do some digging.



**2** Once you've found your CPU settings, there should be an option to increase it by 1MHz at a time. We suggest upping it by 5MHz, saving your settings and then booting into XP to check that everything is OK. By working in small measures you're unlikely to blow anything up without warning.



**3** In XP, nip over to **Control Panel→System** and have a look in **General**. You should see a description of your chip (in our case, a 2.66GHz Pentium D) and, below it, the satisfying actual speed post-overclocking. Repeat as necessary, but be sure to check the volt modding box.

## Here's how we did it...

Our route from a lowly 2.66GHz golf cart to a 4.1GHz Testarossa

We'll admit there were coos of amazement as we watched the GHz climb. It was easy to up the CPU frequency and watch the x20 multiplied final speeds approaching that magic 4GHz mark. Best of all, the stock cooler was entirely sufficient for keeping the chip in our well-ventilated test rig nice and breezy. Having started at 2.66, we headed up to 3GHz and gave some of the benchmarks a whirl. The biggest gain by far was in the multicore-patched Quake IV, which leapt

from an initial 53fps to a staggering 84fps in just this initial stage of overclocking. 3DMark06 gained to the tune of 63 marks, going from 3,069 to 3,132. Next stop was 3.5GHz, still at stock voltages and with stock cooling, and we saw more gains in 3DMark, hitting 3196. PCMark, which was initially a lowly 4,403 had by now reached 5,192 – beating the entry level Core 2 Duo to the tune of 130 marks. The area where the Conroe still pulled ahead, though, is in the WMV

encode benchmark, demonstrating just how impressive Intel's latest chips are at codec wrangling.

By the time we hit 4GHz we were juggling some big numbers, with the aid of the £30 Zalman Fatal1ty cooler and a core voltage of 1.65. At 4.1GHz we were shifting 93.9fps in Quake IV, stopping the WMV clock at 1:32 and gaining 5198 marks in PCMark. This is an incredible achievement, particularly in the case of Quake IV, which has nearly doubled in framerate.



# GPU



In the quest for silky smooth visuals, choose your weapon wisely – then sharpen its blade

**O**ne brief shudder in framerate can mean the difference between landing a perfect shot and your grisly doom, so any edge in the graphics department is vital.

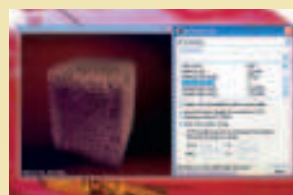
Depending on which card you have, the gains may be slight, but it should be remembered that overclocking a graphics card doesn't require you to dive into the muddy waters of BIOS settings. Grab the right tweaking app from the internet, one that allows you complete control of GPU settings, and you'll be ramping up your graphics card in absolutely no time. Of course there

are also whispers – you hear them loudest when lying alone at night – of the arcane ritual of soft modding. This transmutation spell can convert an unassuming budget graphics processor into something with a bit more kick.

Unused pipes, blocked off during the manufacturing process, flow with sparkling torrents of pixels and framerate and wallet weight reward you in tandem. Of course this won't work with just any card, even varying from unit to unit, but if you're lucky, you may just have a sleeping giant resting in that PCI Express slot.

## Soft modding

Does your card have hidden potential? It all depends on the manufacturing process...



### Why?

The reason soft modding works is that during the fabrication process, manufacturers take cards with defective pipes, shut off the ones that don't work and sell them as budget cards. Essentially they're the same as their high-budget brethren, but hobbled. With a BIOS flash, some can be persuaded to work at full capacity.

### How?

A simple software flash, but be warned, this could go wrong and wreck the card altogether. The internet is littered with sorry tales of borked soft modding experiments. Anyway, those with an X1800GTO who wish to dance with the devil in the pale moonlight can head to [tinyurl.com/qarcq](http://tinyurl.com/qarcq) and follow Sefu's detailed instructions.

### Result?

Well, it didn't work for us with our Sapphire card. If you do manage it, though, add some proper clock tweaks (as detailed below) and you'll have what is approaching an X1800XT in terms of both physical makeup and clockspeed. That's a card that regularly trades for £190.

**"Overclocking a graphics card doesn't require you to dive into the murk of your BIOS settings"**

## Test bench

How we got our results

We used several different benchmarking applications, both to test our overclocked rig and to ensure stability at the mammoth clock speeds we achieved. Each program was chosen to garner a different perspective on the changes we made.

**>> PCMark05** A strong all-round benchmark app that gives an overall score for a system and takes many factors into account. Run at default settings

**>> 3DMark06** At default settings, this benchmark

attempts to account for graphics and CPU tests that might be commonly encountered in games.

**>> Quake IV** We ran the latest patch at 1,280x1,024 at high detail to provide a real, rather than synthetic, example of gaming gain.

**>> WMV Encoder 9** We chose to transcode a DIVX file into a 1,073Kbps WMV file with DVD-quality CBR video and CD quality CBR sound for a real-world encoding result.



## OVERDRIVE

ATI's tuning tools

If you have an ATI card and the latest drivers, within the Catalyst control centre there's the ATI Overdrive panel. This is a somewhat limited overclocking utility that does a reasonable job of letting you up your graphics card clock and memory speeds in a cosy and safe environment.

Of course, if you really want to make the big gains available with your graphics card, you'll have to go beyond what's officially allowed, but for those dipping their toes in the water, it's certainly a start. NVIDIA card owners will need to unlock Coolbits by modifying their registry settings, as detailed in the readme file at [tinyurl.com/jsww2](http://tinyurl.com/jsww2).

## Going to the next level...

With the basics established, it's time to push the overclocking envelope

Our first step in overclocking the X1800GTO was to attempt soft modding. Thanks to reports from those who'd managed it already, we managed not to snap our card in half, but a cursory glance towards ATITool post-op showed that our pixel pipes resolutely refused to double in girth. Obviously, this sort of thing isn't possible with all cards, because the pipes are often blocked off because of manufacturing defects, which are picked up in the testing process for the higher

spec cards – sometimes you'll end up trying to activate cards that have busted pipes. Luckily, as long as you make a backup of your original BIOS during the process you should be able to reflash without worry.

Next, we decided to have a dig around in the catalyst drivers to see how well the Overdrive setting handled the CPU and RAM clocks. The answer was reasonably, but an upper limit of 550MHz for core speed and 575MHz for RAM speed was hardly likely to

set our boxers on fire. If you'd like a bit of a low-risk performance boost, though, go ahead. We, on the other hand, tracked down Overclocker.

This app is aimed at the X1800 and allows control over clockspeeds and voltages. We had our X1800GTO ticking along at a core speed of 621 and memory speed of 657, shunting our 3DMark score from 3,179 to 3,483. Our favourite part, though, was attaining 100.8 frames per second in Quake IV. Result!

# RAM

Mix memory capacity with lightning access speeds like some kind of horrifying bionic elephant



**O**ur endeavours with the CPU are going to result in leaps in the access speed, simply by virtue of the fact that we're cranking up the juice on the FSB. Still, that doesn't mean there aren't tweaks to be made to the memory. You'll probably have to select new options for memory

asynchronous fashion, meaning bumps to the FSB have a more pronounced effect on the memory speed. Often motherboards also offer options to volt mod the memory to increase stability.

Latency is the other great tweak for memory, increasing the speed at which bytes are delivered by the

**"At higher frequencies, low latencies often cause instability, so caution is advised"**

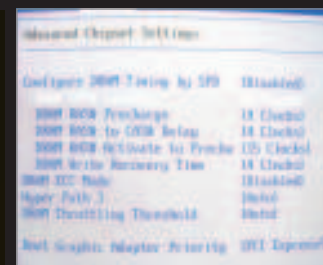
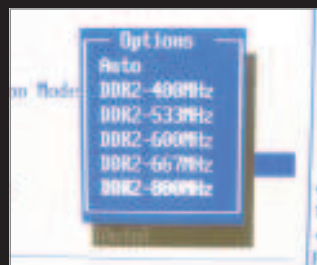
speed as they become available through your CPU overclocks.

Another option that may be available, depending on your mobo and memory setup, is to alter the synchronisation of your memory. Changing the ratio allows you to alter the speed of the RAM in an

RAM, and by and large the rule is the lower the latency the better. Unfortunately at higher frequencies, low latencies often cause instability, meaning sometimes the best combination is higher frequency and higher latency, even though it seems counter-intuitive.

## RAM raiding

All the speed, none of the crashing



**1** There are two ways to overclock your RAM, the first is to choose the higher options as they appear when you increase your FSB speed. These higher options relate to the ratio of RAM to front side bus speed. If you crank up the CPU frequency to 200, these should be your options.

**2** The other method of speeding up RAM is to lower the latency. While this does result in a performance increase, often to allow the memory to run at higher frequencies the latency must be sacrificed. As you get bigger gains from the FSB, latency always takes a back seat.

## Glossary

Terms you need to know

We're throwing around techie terms about as quickly as we're clocking our chips, so if you're stumped, perhaps this little list will enlighten you. Look after yourself out there.

**FSB** Front Side Bus. In Intel chips the FSB is quad pumped, meaning the final number is a 4x multiplication of the CPU frequency. 200MHz CPU frequency equals an 800MHz FSB.

**Multiplier** The final processor speed is the net result of a base frequency and a multiplier. For example, your 2.66GHz chip could well be

the result of a 133 base frequency and a 20x multiplier.

**Soft modding** Making changes to the software or firmware in a piece of hardware. The device isn't changed but locked pipelines can be opened, for example.

**Volt modding** As you crank up the clockspeeds, components draw more power. If the motherboard isn't feeding them enough you'll get lockups and crashes. Too much and a thin wisp of smoke will be your reward.

## BURN IN Heat your Hz

According to consensus, the practise of burning in memory can garner extra performance. The way it works is, if your system memory is refusing to run at a particular speed. Drop the speed to the next

working value and run a torture test for a day or so, then try your higher speed again. Rumour has it that this also works, to an extent, with CPUs – though not in quite as pronounced a fashion.



## Overclocking secrets you need to know

### GOLDEN RULE

Always remember when upping your CPU that your RAM may not necessarily be able to keep up. For the best results you need RAM that is happy to over exert itself, such as the Corsair sticks we've been using, which while rated as 675MHz performed quite happily at 800MHz.



## Getting the most from your CPU

Push your system memory, and you'll be rewarded

We must admit, RAM was an area where we initially had some problems. Originally we were running the Asus P5B Deluxe board and the memory was not clocking up beyond 533MHz for love nor money.

It's difficult to extricate the RAM benchmarks from our CPU results, as the increases in the core frequency are what has driven our RAM to its overclocking heights. If you drop the RAM from 800MHz to the ratio offering 667 at 4GHz CPU speed,

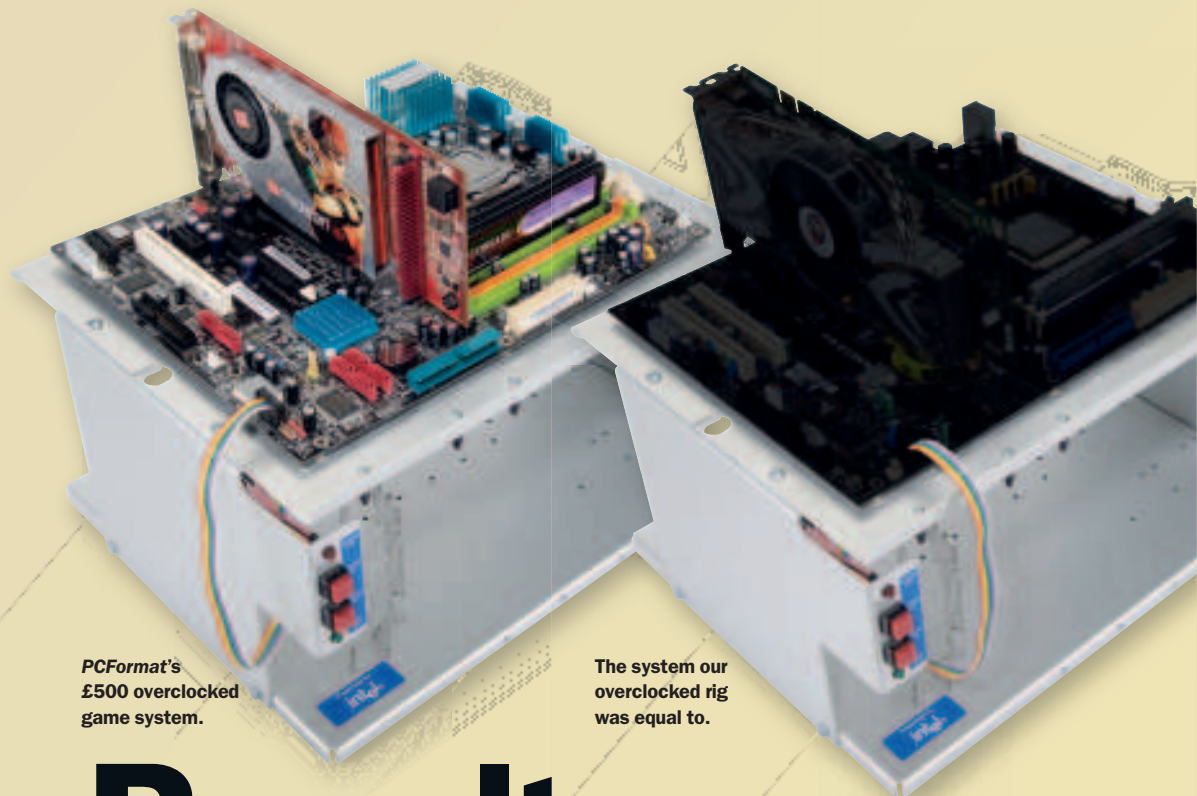
you lose all of 10 PCMarks. All you really have to do to ensure you're getting the best from your RAM is to ensure the highest option is selected as you increase your core frequency. Of course, you may need to increase the voltage to increase stability but, by and large, the advantage this gives you is rather minuscule.

As for latency, we had no luck booting the RAM at anything lower than 4/4/4/12 which, depressingly, is what is written on the sticks themselves. Still, as we

mentioned above, latency is often the first casualty when clocking RAM to ludicrous speeds and it seems PCF's little overclocking jaunt is no different.

Overclocking RAM is hardly something to worry about when you're cranking up the MHz on your CPU – it just gradually climbs in tandem. It is important, though, as with the stock CPU frequency, the Pentium D 805 was hitting a brick wall at 533MHz, completely under-using the memory.





PCFormat's  
£500 overlocked  
game system.

The system our  
overclocked rig  
was equal to.

# Results

The monster we've created gets its first run out, and it's scaring all the other PCs to death...

**A**fter hours of bleary-eyed BIOS tuning we've finally, thanks to dogged perseverance, created a ridiculously beefy rig from something that wouldn't have worried a dandelion before we started. There have been trials and tribulations, not least a

hasty motherboard swap before we started in earnest. Luckily, the results speak for themselves – we have made some massive gains and the reaction from the gathered members of the *PCFormat* sweatshop has been one of awe and wonder at the ridiculous

4.1GHz figure we finally achieved. Best of all, we never smelt the worrying whiff of burnt cabbage, which we lived in constant fear of throughout. Have a look at the comparisons of where we started and where we've arrived. We think you'll be mightily impressed.

	ORIGINAL SPEC	WITH CONROE	OVERCLOCKED	COMPARISON PC
PCMARK05	4,403	5,062	5,192	4,312
3DMARK06	3,069	3,093	3,196	3,312
QUAKE IV FPS	53.3fps	90.9	108.8	94.8
WM ENCODER	2:16	1:40	1:32	1:40

## WHAT WILL TORTURING MY PC COST?

Compare a Brand X PC to our list



**XFx 7600GT**

£135

[www.savastore.com](http://www.savastore.com)

**Abit AT8 32X**

£130

[www.midlandcomputers.com](http://www.midlandcomputers.com)

**Athlon X2 4800+**

£376

[www.xtsit.com](http://www.xtsit.com)

**Crucial Ballistix 1GB PC-6400**

£117

[www.redstore.com](http://www.redstore.com)

**TOTAL**

**£758**

## Conclusion

We're tired, we're hungry, but we have an awesome rig

If one thing is clear from this entire shebang, it's that overclocking is not something to be afraid of. Most of the components in your PC have failsafes, and even without them, you'd have to be cranking the wick up in stupid increments without noticing things were getting sketchy beforehand. Of course, as everyone will remind you when overclocking, your mileage may vary. Computer components differ wildly in their makeup and even on a unit-by-unit basis, you can get a completely different response to your overclocking endeavours. By that same token, the reason this project has been so successful is a really rather exceptional chip. The Pentium D 805 2.66 has done us proud, going beyond the call of duty. Whether the chip was released as an intentional target for overclockers or just as a cheap way to manufacture a budget chip is irrelevant – this is probably the most tweakable processor in history.

Don't be put off, though, if you have neither the funds nor the intention to buy this wunder-

chip. Hopefully this guide will encourage you to take a look at those BIOS options and see what you can muster from your existing kit. The PCF team has certainly been grabbed by overclocking fever, with AI making some hair-brained dalliances into the realm of 4.5GHz on his home rig. Alec's discovery that his own PC's BIOS rates overclocking percentages in terms of army ranks had us amused, but underlined the point that the motherboard you use is as important as anything when tuning your PC.

While the CPU ratings shouldn't be sniffed at, we were also impressed by how well the X1800GTO clocked, despite our lack of luck with soft modding.

It seems if you're serious about getting more from your favourite games, but short on dough (many students are included in that particular venn diagram) then perhaps overclocking could even be considered a clearly viable alternative to upgrading.





## Be prepared for everything

Before you start monkeying around with your PC, it's important to make sure you have the right tools for the job. There's nothing more annoying than finding the screws for a new piece of kit don't fit your mobo. Every component you buy will come with a load of screws, so always keep hold of any spares just in case other components aren't so well equipped.

You'll also need an assortment of screwdrivers with different heads and different handles, as well as a pair of small needle-nose pliers to pick up the irritating little bits that fall into the dark recesses of your PC case.



### Maximum safe processor temperatures

Processor	Max temperature (°C)
Athlon XP2200+ and faster	85
AMD Opteron (depends on model)	69-70
Athlon 64, FX and Sempron	70
Athlon 64 x2	65
Pentium 4 (varies on clockspeed)	64-78
Pentium M	100
Pentium D 820	63
Pentium D 830 and 840	70



# Everything you need to know about cooling

The Summer months can be responsible for causing Saharan temperatures inside your rig. **Dave James** investigates the best ways to help your PC cool off

## How we tested

We felt the only fair way to test all the components was to have our base rig as a standard, install the parts and benchmark them individually. The

PC we used is an AMD Sempron 3400+, 1GB RAM on an EPoX 8HEAI motherboard and a Maxtor DiamondMax 11 500GB hard drive, all mounted in an APlus Clío 2 case with a 250mm side-mounted fan.

In order to benchmark the cooling effects of the different equipment, we had to overload the parts. For CPU and GPU cooling we used a real-time HDR rendering engine running solidly for ten minutes. This ran both processing units at 100% and so generated a lot of heat in both processors, and also around the case. Ripe for chilling then...

For each component we tested the temperature after ten minutes standing, and again after the ten minute tests using Everest Ultimate Edition 2006.

**U**nless you've ever been elbow-deep in CPU multipliers and arcane clockspeeds since you were a nipper, the chances are that you're still running the stock cooling unit that came with your processor. We all know that they're not as efficient as (and often much noisier than) dedicated manufacturer's efforts, but hey, your PC works and doesn't fall over too often. And if it ain't broke...

The only problem is that high temperatures inside your case can speed up the degradation of the various components that make up your PC. Unofficial estimates say that simply knocking 10°C off the overall operating temperature of your CPU can double its life expectancy. Even if you're one of the lucky few that can replace your processor every couple of years, a cooler-running CPU won't be in danger of locking up should the room temperature get too high. It's a similar story for most of the other components in your rig, such as the

hard drive and the real money-sucker, the graphics card.

We challenged ourselves to find the best ways to cool down components, whether they reside in an overclocked beast, a dual-core joy or an average gaming PC.

## CHILL PILL

Everyone's aware that air-cooling is the common approach, as most PCs come with chunk-off fans blowing cool air over hot coals, sorry, heatsinks, and whine away

mainly because more and more manufacturers are producing systems that even your Nan could put in her PC. We've got our mitts on a couple of sealed water units, as well as a DIY radiator and full-spec cooling system, just to see which alternative offers you the best in cool runnings.


Finally, we've taken a look at the weird world of the cooling via the Peltier effect. Working on the principle of thermoelectric chilling, Peltier coolers use different types of

**"Knocking 10°C off the operating temperature of your CPU could double its life expectancy"**

into the wee hours. Air cooling doesn't necessarily have to be loud, however. The larger the fan the more efficient it is, and therefore doesn't have to spin as fast. Lovers of peaceful, quiet gaming should opt for as large a fan as possible to cut out that grating whine.

The golden boy of rig-chilling is currently water-based cooling,

metal connected together to create a transfer of heat from one to another. Complicated? We'll explain it all overleaf in words even we can easily understand...

Over the next few pages we'll find out which type of cooling works best and where. Once we've finished with you, your PC will be an oasis in the desert. 

## Thermal compounds

How much difference can a little tube of gunk make?

No-one likes thermal paste, it's a fact. It's hideous, and has a tendency to get absolutely everywhere as soon as you apply it. Without it though, the silicon inside your precious CPU would be so much melted slag by now.

What it does is to ensure full contact between the cooling plates and the CPU surface. No matter how well a processor is manufactured there will always be minute faults on the surface, and without the much-maligned paste, these faults stop an even spread of the

beneficial cooling effects they so desperately need.

We selected four of the top thermal compounds on the market, just to see if any manufacturer's efforts made a difference at all. We chose Zalman's Super Thermal Grease (£6, [www.scan.co.uk](http://www.scan.co.uk)), Akasa's Pro-Grade+ (£7, [www.scan.co.uk](http://www.scan.co.uk)), CoolerMaster's Premium (£5 [www.aria.co.uk](http://www.aria.co.uk)) and finally Arctic Silver 5 (£5 [www.aria.co.uk](http://www.aria.co.uk)).

Testing them on the same CPU and stock cooling system we found



something that's unlikely to shock you. The biggest difference between the compounds was two degrees. Akasa's Pro-Grade+ gave the lowest reading, but simply for ease of use, Zalman's offering wins through.



## Water cooling

Scared out of your wits pumping water through the electrical labyrinth of your PC? You'll have to conquer that fear if you want to get some serious cooling

**T**he Alphacool Passiv required a lot of assembly, a bit of prior knowledge and plenty of patience. The kit includes all you need to get your CPU fully water cooled, and with an extra water block and connectors, you can build your rig into a liquid oasis of cool.

That said, you've got to put it together first, which is only made harder by the poorly translated instructions. The spiky looking radiator you mount on the side of your case cools the water, which is then fed through the system via an external pump. This gives a lot of space inside the case for added air-cooling, should you feel the need, and allowed us to make use of the huge side fan of our Clio 2 case to great cooling effect.

The Cool Answer system (£113, [www.scan.co.uk](http://www.scan.co.uk)) took only 15 minutes to install. The CoolerMaster Aquagate Mini (£42, [www.scan.co.uk](http://www.scan.co.uk)) takes about an hour to install, but comes pre-filled.

Both these units fit inside your PC without any extraneous wires and tubing protruding from the case. The interesting

thing is that, because of the amount of space they take up, there's a lack of airflow, which causes temperatures in the rig to rise. So although the all-in-one water coolers make the CPU cooler they raise the temperatures of both the graphics card and motherboard.

### WET LOOK

The water way is also perfect for high-performance graphics cards, particularly for removing the horrible whine of ATI's stock cooling units. The NexXxus from Alphacool (£49, [www.scan.co.uk](http://www.scan.co.uk)) really makes a difference to its ambient temperature. With an X1900XTX, we found the water block was 20°C cooler than with the stock fan alone.

As part of a complete liquid system, cooling both the

### READER'S HORROR

**When I installed my VGA water block I forgot to insert the plastic end inserts into the tubing. When I switched the pump on, the entire contents of my water cooling system splashed out all over the case and my powered-up PSU. Not pretty. cmberly20**



CPU and GPU really would make for a chilly PC, despite the fact that the tubes protruding out from the card stopped us from using our case's side fan. This aesthetic consideration aside, it's great.



## Air cooling

Noisier than a Harrier jump jet? Less effective than spraying water around your lovely PC? Perhaps not. And air cooling is cheapest route to a chilled-out rig

**T**he Zalman Fatal1ty FS-C77 (£38, [www.quietpc.co.uk](http://www.quietpc.co.uk)) was a bit of a dark horse in this test. It required a bit of fiddling with the motherboard to fit the backplate and does need a lot of lateral space around the spreading fins of its copper heatsink but the good points far outweigh the bad. It being a low-profile cooler, we were

### READER'S HORROR

**I very recently fried my RAM due to being slightly heavy handed on the timings, and trying to push things a bit far. Fingers crossed I should be back up to speed and overclocking again pretty soon - this time with a little more caution involved. Demon -KartenCS-**

able to use it in conjunction with a case fan and, because of its own large and quiet fan, it was able to cool down not just the CPU but the ambient temperature of the GPU and motherboard too.

The results were very impressive. It beat all the water cooling units hands down, cooling the CPU by 5°C more than full systems costing over £100 more, with the case's side fan running in both instances, and quietly too.

The Asus Silent Square (£50, [www.asus.com](http://www.asus.com)) is just plain huge, standing proudly above the motherboard. However it fails to hold its own against the

Zalman, or even the stock fan with the Clio's side blades whizzing away. It's a cinch to fit, but just doesn't do the necessary, despite being a very quiet solution.

The Asetek Vapochill (£31, [www.scan.co.uk](http://www.scan.co.uk)) stands somewhere between water and air cooling, but is

out-performed on all levels. It has a heatsink containing a liquid which, when heated, vaporises and rises to the top of the pipes where the fan cools it down and liquefies it once more. All very impressive, but given its poor results, largely irrelevant.

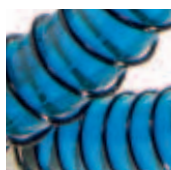
### PIPING HOT

Another alternative to the age-old whining GPU fan is Zalman's ZM80D-HP Silent Dual Heatpipe heatsink (£27, [www.quietpc.co.uk](http://www.quietpc.co.uk)). It is essentially two huge heat-displacing plates which you slap above and below the CPU and VGA RAM modules. It ran our X1900XTX a couple of degrees cooler than the stock fan and was completely silent, but even with the optional 80mm fan (£6, [www.quietpc.co.uk](http://www.quietpc.co.uk)) it's still very quiet, and managed to cut the temperature by another 5°C. It makes your card look impressively space-age too, with the heatpipes running off it, and if you can't spend the money on water-cooling, this is the perfect antidote to whiny ATI fans.



Noisy it may be, but air cooling is reliable.





# Peltier cooling

Who'd have thought we'd be mentioning French physicist Jean Charles Athanese Peltier in this test? People in the know about the Peltier effect, that's who

**T**he Peltier effect was seen, not so long ago, as the answer to the ever-increasing demands placed upon increasingly fast processors. The principles upon which Peltier, or thermo-electric coolers (TEC), are based on date back to the 1830s, and the discovery

## READER'S HORROR

**I lost my temper trying to fit a new heatsink and fan on my old Pentium 4 processor, and stabbed the motherboard with a blunt screwdriver.**

**GDad**

*We've felt much the same at times this month, particularly a certain Mr Channel, when trying to overclock his machine.*

that when electricity is passed through two different metals connected together at two junctions, the heat travels with the current from one to the other. This results in one surface becoming very cool as all the heat is driven out of it, while the other dissipates said heat.

## PELTED TO DEATH?

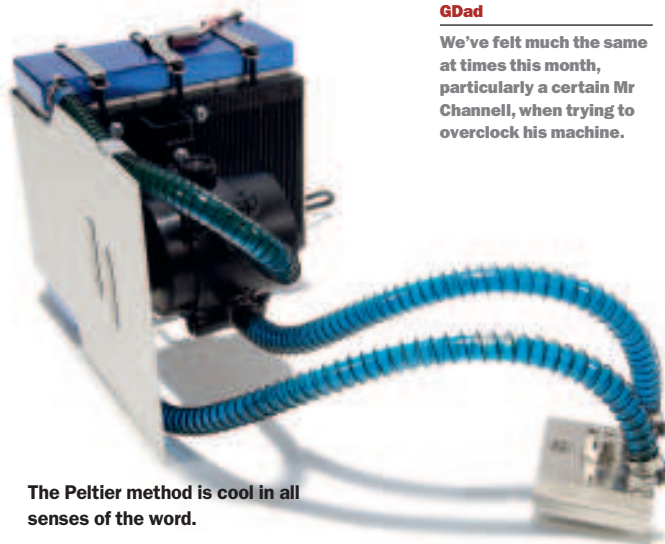
When your old processor was producing half the output that your current CPU does, TEC coolers were the overclocker's best buddy. These days you can't get hold of one for love nor money, and we've discovered why. A modern CPU outputs at around 150-200W, and for a Peltier cooler to work effectively it has to output twice what the CPU is putting into it. This means that to get a TEC cooler functioning on today's chips it needs a hefty 400W just for itself, way more than any reasonable individual has powering his machine.

It's not the death-knell for the Peltier cooler though, as canny manufacturers are now using it in conjunction with

water-based systems to rapidly chill the liquid. It works out far more effective than traditional water cooling – as the CoolIT Freezone (£199, [www.chillblast.co.uk](http://www.chillblast.co.uk)) proves.

Of all the systems we've jammed into our test rig over the course of this feature, this one was the simplest installation of all. You still have to do a fair bit of mucking around with the motherboard, but everything you have to do is laid out in the most basic terms with huge colour pictures. There's even an online installation guide should you get stuck, or just want to watch a pretty lady fitting hardware to the inside of an overheating PC ([tinyurl.com/mp33](http://tinyurl.com/mp33)).

Like the other all-in-one kits in this round-up, this one takes up a considerable amount of space in your case, which meant that we couldn't use the Clio's case fan, but it still managed to keep our Sempron idling at 28 degrees, and won joint-lowest temperature with the Fatal1ty, stable at 38°C on full load for 10 minutes.



The Peltier method is cool in all senses of the word.

# Cool conclusions

Which heat-dispelling method should you go for?

TECH SPECS	MOTHERBOARD TEMPERATURE	PROCESSOR TEMPERATURE	GPU AMBIENT TEMPERATURE
<b>STOCK COOLING</b>			
Stock Cooling w/ Clio 250mm fan	37	55	53
<b>WATER COOLING</b>			
Alphacool Passiv Set	35	47	56
Alphacool Passiv w/ Clio 250mm fan	31*	43	45
Alphacool Cool Answer	33	46	54
CoolerMaster Aquagate Mini	38	44	55
<b>AIR COOLING</b>			
Zalman Fatal1ty FS-C77	34	43	46
Zalman Fatal1ty w/ Clio 250mm fan	30	38*	42*
Asus Silent Square	31*	50	50
Asetek Vapochill Micro	32	55	47
<b>PELTIER COOLING</b>			
CoolIT Freezone	34	38*	52
<b>GPU COOLING</b>			
Stock X1900XTX Cooler			63
Stock X1900XTX Cooler w/ Clio 250mm fan			50
Alphacool NexXus GPU Water Block			43
Zalman ZM80D-HP Dual Heatpipes			61
Zalman ZM80D-HP w/ optional 80mm fan			55
*Best in test			

**T**he method by which you cool down your beleaguered rig is, of course, up to you, but there are many variables you need to take into account. Are you after the coldest PC in which to overclock each and every component you can get your experimental mitts on? Or are you looking to replace the stock cooling systems in favour of a method that won't keep the neighbours awake?

If you've got the money and the inclination, then a water-cooled external radiator and pump is the most excessive way to show it. A couple of well-placed fans pushing air over the components to then be sucked out by a second exhaust fan will also keep things nicely chilled. To make it truly effective, you need to run feeds through the GPU and the CPU, as these are the two most potent heat sources in the whole of your rig.

Water-cooling demands maximum effort and cost, however, and you can actually get similar results using the APlus Clio 2 case and the Zalman Fatal1ty CPU fan. That combination gets top ranking in both CPU and GPU temperature tests, and is over £100 cheaper than the CPU-freezing Freezone Peltier cooler. The pair may not be silent, but they're not exactly going to blow your eardrums out either. Worthy winners. **PCF**



It may be set in the future, but the action's as hardcore as any mid-20th century battlefield.

# Battlefield 2142

DICE has taken the risky choice of catapulting the much-acclaimed *Battlefield* 136 years into the future. Mike Channell finds out if it'll recapture the spirit of *Star Wars*, or prove to be a load of old *Spaceballs*

**S**ome things are timeless: Groove is in the Heart by Deee-Lite, for example, or perhaps the advice that you should always lift with your legs, not your back. Other things, however, are not – most notably, the haircuts in *Logan's Run* do nothing to convince

us that even the notoriously cyclical world of fashion will ever return to the 70s bouffant in the 23rd century. Luckily, now that *PCFormat's* hopped over to Stockholm, home of DICE, and spent some time with the forthcoming iteration of the series, it seems we can add the wonderful



Flak peppers a foreboding sky as a Battle Walker flees the scene. Overhead, a colossal Titan bears down on its earth-bound prey. Pah! Legs, who needs 'em?

*Battlefield* concept to our list of ageless good ideas.

We must admit, we were initially rather cynical about the shift to a sci-fi setting. After all, surely half the fun of the *Battlefield* series was getting your hands on bona fide military hardware? A few minutes

spent chatting with Marcus Nilsson, Senior Producer on *BF2142*, was all we needed to allay fears that this might just be *BF2* dressed in a poorly fitting reflective jumpsuit. "The science-fiction setting opens up a lot of possibilities, but it also creates a lot of traps you could fall





You have zero seconds to comply... The Battle Walker is a formidable opponent, but not invulnerable to well-placed attack. So why not get one of your own?



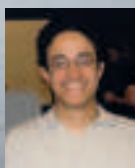
In the much-anticipated Titan mode, you must protect your gigantic ship at all costs. Here, air support is being deployed to assist a ground-based operation.

into," he explained. "I'm actually quite bored of the old plasma gun-type products, honestly, and it's very important to me to get across that we're not that kind of game – that we can make something about the future that is still very true to

objectives. But more on that later. First, a little about the plot...

### COLD WAR

*Battlefield 2142* follows the tumultuous war between the European Coalition and the Pan



**"The Cerbère landing... is really tight, fast-paced and infantry-focused. It's one of my favourites"**

**JAMIL DAWSARI** Producer, DICE

what *Battlefield* is." PCF's sigh of relief was clearly audible.

That's not to say things haven't been shaken up. In fact, *2142* sees the biggest introduction to the *Battlefield* series so far. Titan mode, which was getting the shirts of the collection of journalists at E3 justifiably dribble-drenched, is a new way of playing which combines the best of the old (yet wildly popular) Conquest model, with tense close-quarter battles and genuine, tangible rewards for completing

Asian Coalition. Faced with a rapidly encroaching Ice Age, much of Earth is being swallowed up by huge glaciers. As humanity is pushed into an increasingly smaller space, conflict flares, with heated battles for the last remaining outposts of civilisation. One thing the team is keen to do is create a consistent universe, rather than getting embroiled in predictions about impending geo-political struggles. "DICE is very apolitical. We don't really take a stand. It could be blue

## Stunted growth

There may not be any jet-fighters, but that doesn't mean aerobatics are out in *BF2142*

While we see the removal of jets as a good thing, we were a little worried that it would also remove the joy of wheeling around in the air in a highly erratic fashion. Luckily, Producer Jamil Dawsari was there to reassure us that the gunships are equally capable of ridiculous air chicanery: "We've been playing with the gunship for eight months now, and people are doing things with it that they shouldn't, physics-wise," he said. "As always, it's easy to learn but difficult to master."

Eager for a taste of the aerobatic possibilities, we asked Dawsari what was the craziest manoeuvre DICE's testers had managed to pull off while still avoiding a messy

contretemps with the ground. "They come in fast and then they'll juke upwards," he revealed excitedly. "They go straight up, perform a belly-roll and dive straight down towards the target. The other thing is that we have bloom lighting now, so they'll come out of the blind spot created by the sun, firing as they go, and woe to the tank or mech that finds itself in their sights. It's not intuitive that you should be able to flip the gunship upside-down like that, so the physics are fighting you all the way, but that's half the fun."

The other half, we imagine, is ejecting in a pod just before your gunship becomes a permanent and fiery hood ornament on your target.



## Mech me beautiful

Tired of tanks? Aggravated by APCs? Then this could be just the vehicle you're looking for...

One of the most exciting additions to the *Battlefield* fleet is the Battle Walker – a mechanised infantry unit that sports some rather heavy weaponry. This hulking, stomping mobile slaughterhouse has room for two soldiers and is powerful enough, in the right hands, to take on any other vehicle in the game (barring the Titan, of course).

Executive Producer Marcus Nilsson gave us a showroom-style run-through of why one of these mechs is the place to be in the war zone: "The mechs, or Battle Walkers as we call them, are two-man vehicles, with one main gunner and one man on top. It's pretty much the ultimate killing machine; it's very strong armour-wise. The guy on top can take out gunships and the driver has rockets and machine-guns, making him effective against both land vehicles and infantry."

You'll be pleased to hear, though, that the mechs are by no means indestructible. "The Walker is not as easy to manoeuvre in tight quarters as you might imagine. It also has several weak spots, which have less armour. We're not going to tell people what those weak spots are. They'll have to work that out for

themselves. They are killing machines, but, as always, we've made sure there are plenty of ways to take them out."



The two-man Battle Walker may boast enviable firepower, but there are weak points to exploit.



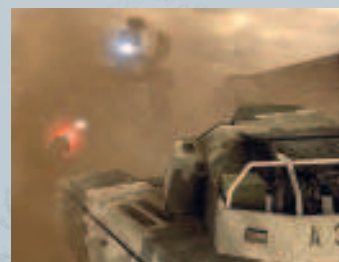
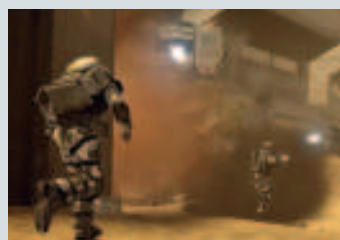
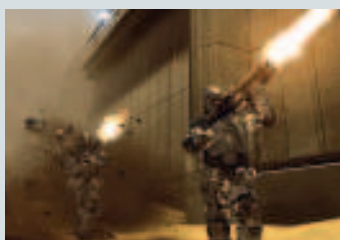
## The net works

This new feature ensures you'll never walk alone

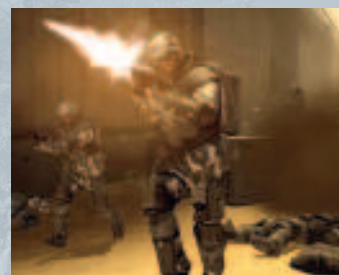
New for 2142 is the networked battlefield, which creates a new incentive for moving in squads. "In a squad, you'll be able to share information through your HUD," Nilsson told us. "If there's an enemy on the other side of a building, and someone in my squad can see him, I'm going to be able to see, via the HUD, that there's a guy there. It's not going to be Ghost Recon, where you outline people so you can determine how far away they are – if we did that, within two days people would be lobbing pixel-perfect rifle grenade shots. As you level up, though, the information becomes more detailed. Run around the corner with a pistol and you'll have a nasty surprise if a tank's there. Later on, your

squad mates will be able to give you the information that it's a tank, and you'll know not to go there unless you have a gun that can take it out."

In practice, this system works well, with enemies clearly marked on the HUD via large red icons. If applied properly – say, with a scout in a safe position overseeing the battle – the networked battlefield can mean the difference between efficient planned kills and running around in a headless-chicken-style panic. It also means that if you have to trudge some distance to reach your squad (the turbo-assisted buggies should put paid to that), you'll have some idea if there's anything to shoot on arrival.



Battle Walker and soldier exchange furious fire amid the dust clouds.



Close-quarters combat is just as exhilarating as it was in *BF1942*.

versus red for all I care," Nilsson told us. "But we need something strong to hook the idea upon, and the important thing when making a game about the future is having an Art Director with a solid vision. *BF2* and *1942* were based on conflicts that happened in the real world, and Googling a T90 tank is much easier and faster than developing ten concepts for a hovertank."

The result is a gritty vision of the future, dominated by gun-metal grey skies, bullets flying (rather than clinical laser beams) and weaponry that rattles rather than fizzles. But, with a plotline so closely tied into the cold environment, is there a danger that the different levels will only feature mild variation? Memories of *Battlefield Vietnam*'s similar jungle scenarios worried *PCF* slightly, so we grilled Jamil Dawsari,

Producer at DICE, on the subject. He assured us that this wouldn't be a problem. "There's a marked difference between the levels, so the European campaign has Minsk, which is huge-scale trench warfare in a large valley, with these large residential towers in the distance, and you can compare that to The



MARCUS NILSSON Senior Producer, DICE

Fall of Berlin, which is a tighter urban environment. Belgrade is another street map, but with more vehicles involved, and the more we play it, the more it feels like

Karkand from *BF2*." Nice to see a nod to what is by far and away the most popular *Battlefield 2* level there, but do the classic levels from 1942 get any futuristic homages? "Verdun is much more of a *BF1942*-esque map. We have the older buildings and the rolling fields with small built-up areas. There's also

**"The science-fiction setting opens up a lot of possibilities, but it also creates a lot of traps"**

Cerbère landing, which is on the coast of France, and that's really tight, fast-paced and infantry-focused. It's definitely one of my favourite maps." It appears, then,

that there's a conscious theme of historical battlefields and real locations, which should provide enough grounding and variety, and prevent *BF2142* from disappearing off into space, so to speak.

### TITANIC BATTLES

So what of this game mode that will supposedly rejuvenate the franchise? Well, Titan mode, which made its debut at E3 in May, is a way of combining the traditional outdoor expanses from the *Battlefields* of yore with thrilling close-quarters combat. Each team has a Titan, a giant floating behemoth of a ship, which looms above the battlefield, providing a launchpad for air vehicles and artillery support for ground troops. Each Titan contains a destructible core, and the objective is to bring



One of the great features of *BF2142* – the 'futuristic' tech hasn't devolved into plasma-gun fantasy. Tanks, albeit more sophisticated tanks, are still present.



That's not to say the DICE team hasn't let its imagination run wild with these 22nd century gunships. Missile contrails stream by as air support engages.





Get on the wrong side of a Battle Walker and you won't know about it for long...



This decent set of tool-ed wheels will ensure your squad isn't left in the dirt.

your enemy's ship crashing to the ground. Of course, it's a slightly more complicated task than just wandering up and chucking a spanner into the exhaust pipe.

For a start, each Titan is surrounded by a shield, which must first be penetrated before unfriendly troops can board. You can simply hammer the shield with ordnance and eventually it will fail, but a far more effective strategy is to lay claim to the missile silos dotted around the map. Much like the command points in the previous *Battlefield* games, these silos must be captured, but once you have them under control, they'll continuously launch missiles towards the enemy Titan, eventually knocking out its defences.

Once the shield has been breached, the next challenge is boarding the ship itself, but DICE has a novel solution for vertically immobile troops, as Nilsson explained to us: "The new way of travelling around, which we know people will enjoy, is shooting yourself in pods. It works from either the Titans or APCs, and you're able to launch yourself high into the air and travel long distances. It's a really neat feature."

Unless you've managed to bag a gunship, pod-launching from APCs will be your primary method of getting up there to continue waging the battle.

Once inside the Titan, the game is transformed into a tense close-quarter struggle to destroy four core control points, and Nilsson took interesting inspiration for these sections. "I've watched the opening scene of *Star Wars* so many times, just to get the timing right. It's not all about code, it's also about the feeling, how it feels to be in there," he enthused. "When you defend that last position, you have one core, they have their squad beacons down and they're coming at you from two directions, but you have your soldiers lying there in their cover with sentry guns and you manage to hold them off... it's an amazing feeling."

### BALANCING ACT

PCF managed to get some hands-on time with *BF2142* during our visit to Sweden, and we can happily confirm that the game is shaping up very well indeed. The first thing that hits you when you dive into a map is the shift in infantry combat balance. While *Battlefield 2* was a fairly

## Twist the knife

*Battlefield 2142* sports a new Reward mode, including an interesting take on knife-kills

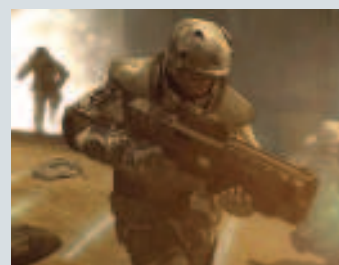
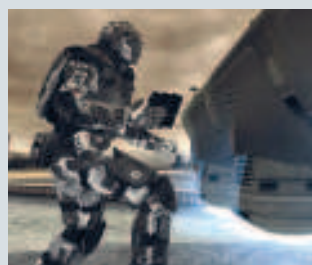


**M**uch has been made of the improved persistence in *Battlefield 2142*. Rather than just rewarding players with new ranks and the odd bit of kit, *BF2142* has an entire unlock tree, with dedicated new weapons and abilities for each of the four base kit types. These four template kits are

Support, Recon, Engineer and Assault. Unlock points, earned as your rank increases, are universal, so you can spend them on any of these four areas and at any level in the tree. Items range from new weaponry, through upgrades such as better zoom or reduced lens sway, all the way to active camouflage, which renders you almost invisible. Each soldier has two available slots for upgrades, with squad leaders receiving an extra slot for items specific to them.

The rank system itself has also undergone a complete overhaul. There are now 43 unique ranks to achieve, with the top three set aside for the 200 best players in the world. Should you meet someone from the dreaded upper echelon, be prepared for a hearty beating. Aside from rankings, there's a badge collection which rewards individual feats – such as escaping the Titan when it goes supernova. We quizzed Lars Gustavsson, Creative Director on the *Battlefield* franchise, about drawing the emphasis away from simple kills and captures. "There's an enormous amount of gadgets and multiple ways to combine them. As players unlock more, they're able to become more specialised. In *BF2*, we gave points for healing people as the medic and suddenly everyone became Mother Teresa, so we're trying to reward people for even more different ways of playing."

Perhaps the most interesting, and potentially humiliating, addition to the reward system is dog-tag collection. When you manage to kill someone with a knife (difficult by anyone's standards), you receive your hapless victim's dog-tags, which are then proudly displayed on your online profile for all to see. Perform enough unique knife-kills and you'll even be bestowed with a new stabbing animation, enabling you to lord it over the hoi polloi. Frankly, anything to discourage the bizarre and slightly disturbing ritual of corpse-humping is fine by us.







Close-quarters combat is, if anything, even more frenetic than before. In the firestorm, keep your cool – and get those Battle Walkers up front...

deadly environment, 2142 seems to give you more opportunity to dive into cover when the flak starts to fly. Your survival also is aided somewhat by the complete absence of jet-fighters. While 2142's gunship is a formidable tool, it doesn't have quite the same lethality as the planes in the previous game, which should go a long way towards eliminating the demoralising instant deaths that occurred regularly in

BF2. "It was a conscious decision," Dawsari told us. "In BF2, one guy in a jet would be having a blast, but he really affected it for everyone else. Unless there was another jet, or you were fast with the anti-air, it wasn't much fun. Invariably people will excel, and will learn to do things with the gunship we just didn't conceive, but we have an ace in the hole, in that the engineer has a handheld anti-aircraft gun as one of

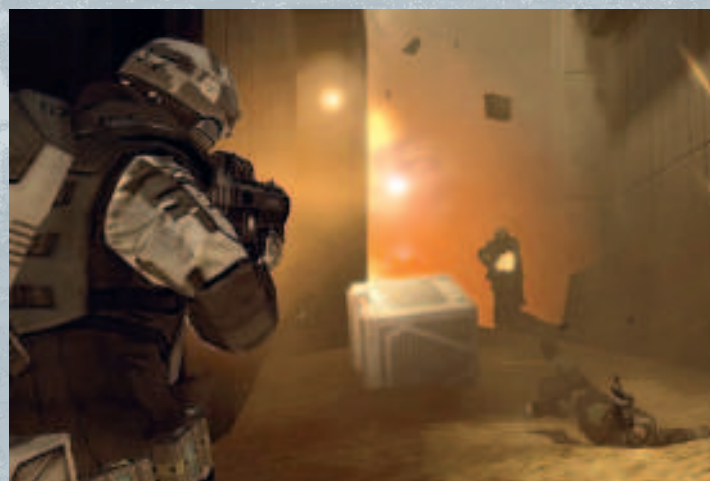
his unlocks. The pilot may say, 'I remember where all the stationary emplacements are'. Well, listen, sunshine, I can still take you out."

From what we've played to date, we genuinely believe that the *Battlefield* faithful will lap up *Battlefield 2142* and its flagship Titan mode – it really does create a different flow from the traditional

Conquest mode and, with every missile taking its toll on the Titan's shields, there's a visible and therefore much more satisfying reward for everything the player achieves. Suffice to say, we're pretty excited about this one, and with the planned open beta arriving soon, you should sign up. Hopefully, we'll see you on the battlefield... **PCF**

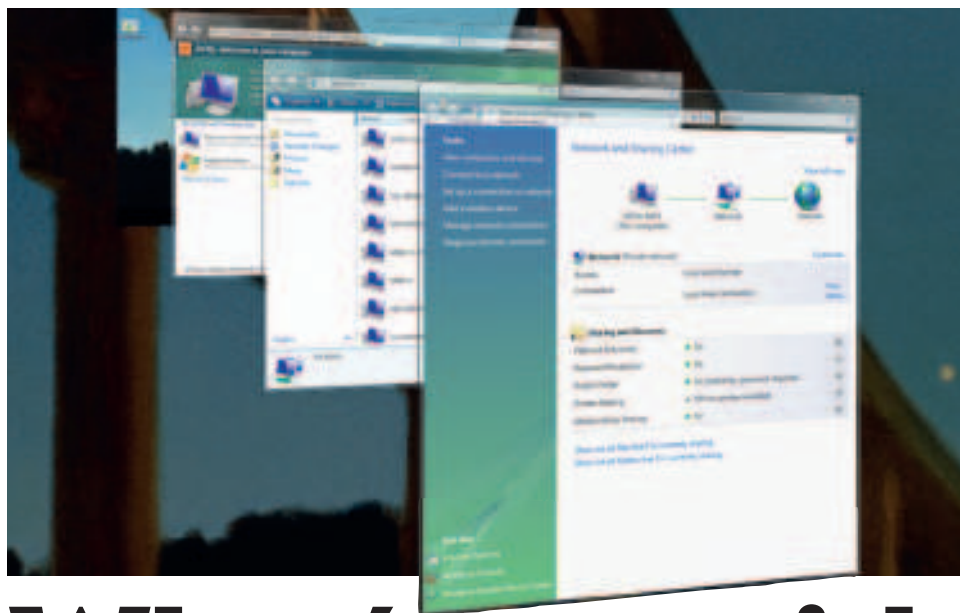


Point, shoot and... Kaboom! The delight of destroying hardware in a blaze of glory is as intact as ever. Just make sure it's the enemy's and not your own.



Of course, it's not all gung-ho extremism out in the open. When your men are navigating the dusty, noisy confusion of the front line, tactics are everything.





# Vista

## What's up with

The tweaks keep coming as Vista nears completion, but will the launch slip again? **Jon Hicks** peers into his translucent, more secure, yet still slightly wonky crystal ball

### HAS IT SLIPPED AGAIN?

No, and if you're a betting type then the odds are still pretty good. So says Bill Gates, who has just announced he's "80 per cent sure" it'll be ready for January as promised. So that's a 20 per cent chance of it slipping, then. We won't be placing even a soggy potato chip until we've seen it make the business launch in November.

### IS IT FINISHED YET?

Not quite, but Microsoft was confident enough to publicly release Beta 2. It won plaudits for stability but criticism for performance issues and the endless nagging of **User Account Control**, which has been toned down for the most recent 5456 build. As we went to press, a new refresh was due for release, promising big speed improvements.

### WHAT'S IN THE LATEST VERSION?

Still far too many security prompts, unfortunately, but it's a tad quicker, there's been greatly reduced

grousing from testers and that vital process of updating the system icons continues. The **List View** in **Windows Explorer** has been reinstated and **ActiveSync** replaced by the **Windows Mobile Device Center**: a new, cuddlier, icon-filled way to browse files and sync media to Windows Mobile devices. The **Performance Rating** tool has been retuned and (terribly) rebadged as the **Windows Experience Index**, following agitation from hardware manufacturers who thought they were getting short shrift. **Network Center** has also been remade (see annotation on facing page), along with **Windows Update**. Ooh, and there's even a new mouse pointer.

### BUT THEY'VE CUT BITS OUT, TOO – WHAT ABOUT WINFS?

Easy, there. **WinFS** was officially cut from Vista in 2004. However, anybody still holding a candle for the promised separate release of a unified file system will have to go away and wash all that

wax off their arm, because Microsoft has canned it and will be using the leftovers in SQL Server. Just the latest twist in one of Microsoft's oldest ideas. Work started on it 15 years ago, alongside the development of the Windows 95 interface.

### SO WHAT'S MISSING, THEN?

Surprisingly little. The only feature cut recently is **PC-to-PC sync** – a peer-to-peer app designed to sync specific folders between different PCs – which handily was rubbish. Microsoft has said it will be the last feature to go.



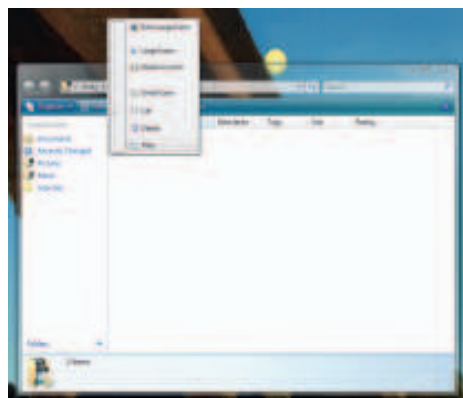
Vista promises an easier time of it if you have a Windows-powered mobile phone to sync with.



You can now drag the tabs in **Internet Explorer** to reorder them as you see fit. Take that, **Firefox**.



Vista comes with **DirectX 10** built in, though there are no DX10 cards or games just yet.



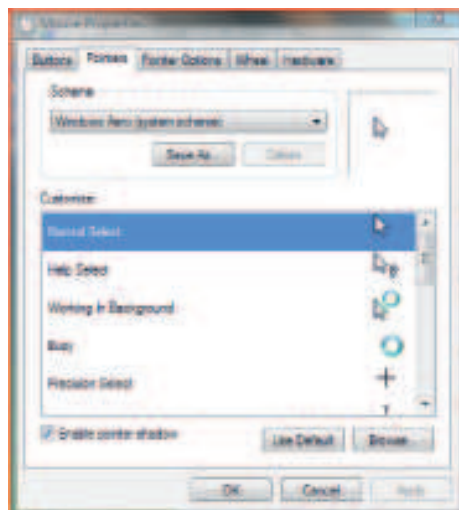
Who'd miss List View? Lots of you, apparently, so it's been put back in. That's the power of democracy...

## WILL IT HAVE PIRACY CHECKS?

Almost certainly. Vista was always going to be tough on piracy because of the **Anytime Upgrade** feature: every Vista disc contains every Vista version, and you just get to unlock the one you've paid for. Given that cracks will be online within seconds of it hitting the shelves, it's reasonable to expect WGA-esque version monitoring.

## WHAT ABOUT GAMES?

**DirectX10** is coming with Vista – and it's staying with Vista, with no version available for Windows XP. That's something of a drag, because it adds a new Geometry Shader to sit between the existing Vertex and Pixel models, improving the graphics pipeline and allowing for more items and physics effects. Games could look better in Vista, and



Microsoft is gradually updating Vista's visuals, with the mouse pointer being the latest to change.

Microsoft is wooing developers to get showcase titles on-side for launch. The *Flight Simulator X* and *Halo 2* teams are in, but it's also talking to Crytek about a shinier version of *Crysis*. Older games, meanwhile, are trickier. There's no specific API for OpenGL to access DX10 features, so Microsoft is adding individual application support. *Quake* is covered (of course), but this could still open up a can of retro-gaming worms.

## WHAT'S LEFT TO ADD?

A new **Standard user theme** and a tuning up of the performance and interface. There's also the

## Benchmarks

PCF compares and contrasts three key operating systems

### BUILD 5456

3DMark: 2358  
Oblivion: 18.889fps  
Prey: 38.189fps

### BUILD 5384 (BETA 2)

3DMark: 2365  
Oblivion: 17.795fps  
Prey: 37.406fps

### WINDOWS XP SP2

3DMark: 2549  
Oblivion: 19.214fps  
Prey: 45.475fps

Although Build 5456's general performance is better than its predecessors, games speed is still left wanting. Things are unlikely to change until Vista's graphics drivers are significantly improved.

tantalising blank space that is **Windows Vista Ultimate Extras**: unspecified extra goodies for those who splash out on the top-end version.

## WILL THERE BE ANOTHER PUBLIC RELEASE?

We're now into a series of interim releases for the beta faithful and MSDN subscribers, with the next big release towards the end of the year. That'll go to everybody, including those who missed Beta 2 while it was publicly available, and you should find RC1 carried with this very mag. **PCF**

### Microsoft McRae

**Windows Rally** is a blend of networking tools in Vista that ensures networked devices are instantly recognised and securely installed with the minimum of fuss. Microsoft would have you believe that installing an access point is simply a matter of plugging it in and entering a PIN; we have our doubts, but can't confirm them because nobody's made any hardware that supports it yet.

### Your call

New in Beta 2 (and broken in build 5456): the colourful **Windows Mobile Device Centre**. Access files and change settings via the simple button controls.

### Get netted

Behold, at last, the new **Network and Sharing Center**. Everybody hated the first iteration, but this one's a lot smoother, defaulting to the more secure Public network setting and giving you at-a-glance views of what's being shared and what's not. It's simpler, easier to understand, and quicker, while the list of tasks has been adjusted to put the more important requests within easy reach.

### Memento morty

The old bugbear raises its head – this PC is doing bugger all and it's taking a lot of memory to do it. Microsoft promises great things from the next release, which is due to arrive just as we go to press, and we hope it can deliver. While performance is surprisingly good on lesser PCs, this is still not something to go to market with.

### To the point

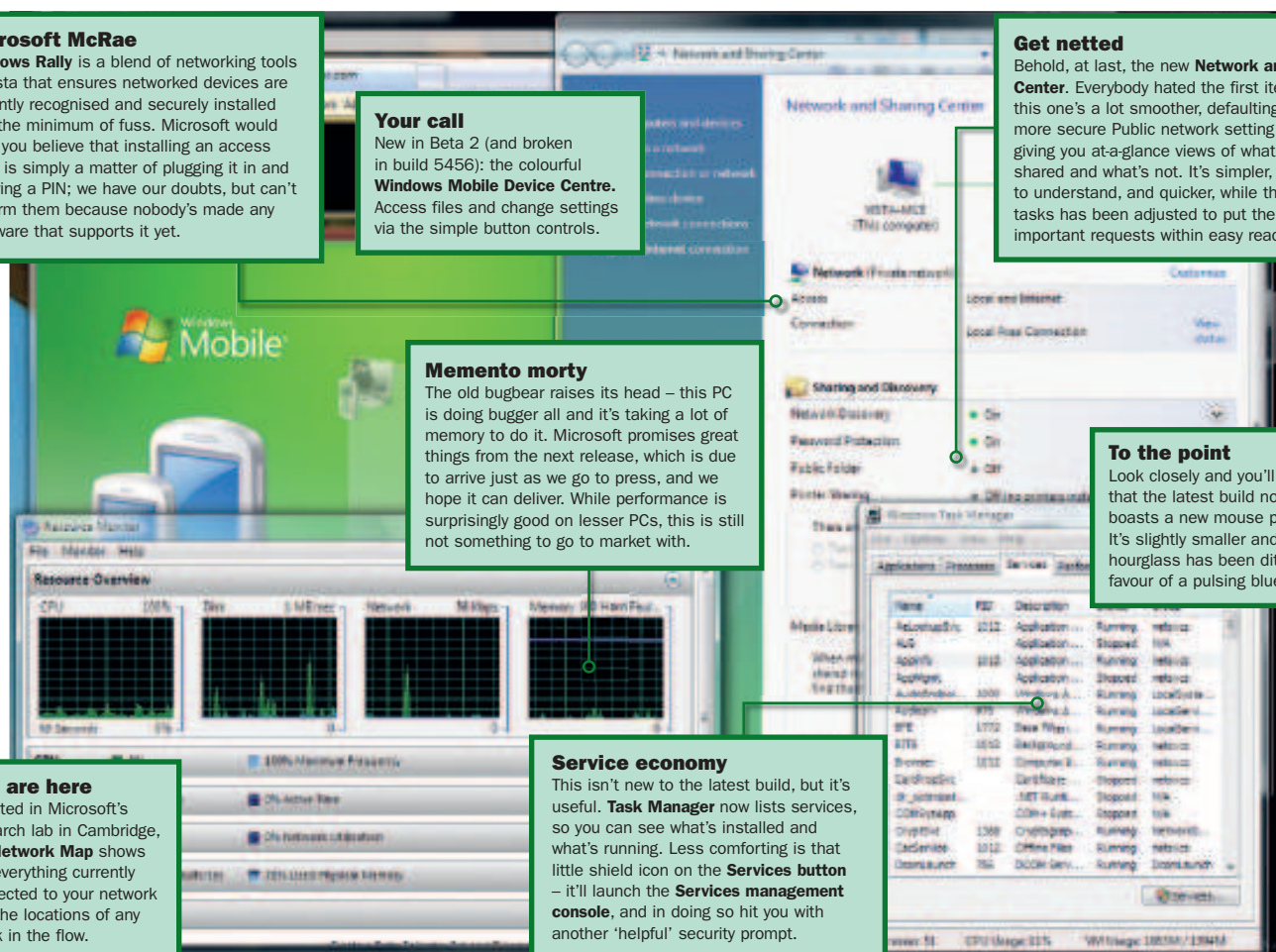
Look closely and you'll see that the latest build now boasts a new mouse pointer. It's slightly smaller and the hourglass has been ditched in favour of a pulsing blue ring.

### You are here

Invented in Microsoft's research lab in Cambridge, the **Network Map** shows you everything currently connected to your network and the locations of any break in the flow.

### Service economy

This isn't new to the latest build, but it's useful. **Task Manager** now lists services, so you can see what's installed and what's running. Less comforting is that little shield icon on the **Services** button – it'll launch the **Services management console**, and in doing so hit you with another 'helpful' security prompt.





# Apocalypse near future

In a world gone mad, who'll be there to keep us from harm? The Joint Task Force, that's who. **Dave James** joins a quest for peace through superior firepower

**F**ledgling development studio Most Wanted Entertainment is edging ever closer to completing its very first project, *Joint Task Force*. Despite the name, it's no anti-drugs initiative, but a new take on the war on terror.

With the world and its assorted life-partners pumping out real-time strategy games like they

## World beaters

We all stand together...

The *Joint Task Force* is made up of an international hotch-potch of military might. There are six nationalities specialising in different areas of the infantry alone. There's US Rangers, British commandos, highly trained German snipers, Dutch and Hungarian medics and French engineers. Each individual can be kitted out with a wide range of equipment, depending on how you want them to act in a given situation. Should they succeed, an individual could also be promoted to 'hero' status for use in later missions, and start building up a pool of valuable skills.

This spirit of solidarity isn't limited to the game characters, however, as you can play through the entire singleplayer campaign with another player in the team co-operative mode.

were vital to humanity's existence, though, why is it that we need yet another? Well, this time we're talking about something slightly different: a pacifist RTS.

This sounds unlikely, to say the least. Are the troops storming into battle cradling lambs in their arms? Are they playing soothing whale music at obscene volume as choppers swoop over enemy lines? *PCFormat* talked to Most Wanted's Development Director, Vincent Van Diemen, about the anti-war RTS that looks the bomb.

**PCFormat** As the theatres you have chosen – Bosnia and Iraq among them – are so close to the bone, was it easier to brand the game anti-war, and was that the reason for doing so?

**Vincent Van Diemen** No, basically it's not the reason, but it definitely makes it easier for us. We have *Full Metal Jacket*, *Apocalypse Now* and *The Deer Hunter* for Vietnam. An anti-war theme in movies is not unusual, but for games it is. We thought it would be nice, not necessarily to make the *Apocalypse Now* of games, which would be too ambitious, but something else.

**PCF** How is this anti-war, then?

**VVD** This Matthew O'Connell character that you play was a field agent for the CIA, did a lot of nasty stuff and really wanted to break away from that. He is almost naïve, because he thinks that by being a soldier you can do good by your country.

Once he gets the opportunity to lead this small task force, he ends up in situations where, for some convoluted political reasons, he is ordered to assassinate people and political leaders. At the end of the game he becomes even more disillusioned, and he stays behind in Baghdad to live out the rest of his days. There's no happy ending to this game...

**PCF** How does the all-seeing eye of the media affect the game?

**VVD** The JTF has been created as a rapid-response strike force which deals with situations that the UN troops cannot, simply because of the bureaucracy that exists within the United Nations. As such, there are different countries funding the group, so if you do crazy stuff in front of the media, other countries will be more reticent about



**"The Joint Task Force is a rapid-response strike unit which deals with situations that the United Nations troops cannot"**

giving you funding. So, accidentally targeting a church will adversely affect your funding, and your deployment options will be severely limited. In some situations, funds can be taken away from you mid-mission as a penalty for non-compliance or recklessness.

**PCF** Do you have any control over what the media see?

**VVD** In a few of the missions the media are deployed with your team and under your direct control, so you have a say over what they do and what they see. One of the main characters in the game is a journalist, and sometimes she is embedded with your troops.

**PCF** With the marketplace already saturated by real-time strategy titles, what is it that separates *Joint Task Force* from its contemporaries?

**VVD** The easiest way to say it is that our game is much more tactical, maybe it's a bit hardcore. In most RTS games you have bases and resource collection, and your success in the game depends on maintaining these two areas, but in fact you can make as many tanks or whatever as you like. *Joint Task Force* is much more tactical, much more low-scale. I explain it to people by saying that it's as close to a turn-based dynamic as you can get with a real-time strategy game.

If you simply select all your troops and send them forward, you'll achieve some initial success in a mission, but you won't get more than halfway through *JTF* like that. In *Joint Task Force*, you have to select your units, consider which troop formation to use and then

anticipate what might befall your troops before you send them anywhere, because all your troops are very fragile. A tank could easily bump into an enemy infantry unit with anti-tank weapons and it'll be gone in no time.

**PCF** Is there anything you wanted to include in *Joint Task Force* that you weren't allowed to, or couldn't quite translate successfully into the game for some reason?

**VVD** Yes, there was. *Most Wanted* is part of Dutch publisher HD Publishing, and Holland had its own traumatic experience in Bosnia, one of the theatres in the game. The Dutch UN troops were in charge of the protection of Srebrenica when Mr. Mladic walked in and there was the big massacre.

The complicated UN command structure was a problem for the Dutch soldiers. In the end it cost an estimated 9,000 people their lives. Of course the Dutch played their role, too.

I wanted to give the player Srebrenica and to do it properly. No complicated command structure, no UN bureaucracy. It might have caused controversy, which we don't mind, but the team was hesitant about it being the biggest massacre since World War 2. As far as I'm concerned, it's still in for the expansion packs though. Maybe.

So, there are no lambs, no whale music and the bombs are still in evidence. We're not sure that's entirely anti-war after all, but at least the violence comes with consequence, and that's a rather welcome feature in itself. **PCF**



Wheeling out cutting-edge military hardware in a PhysX-enabled urban environment lends the game a sense of genuine, visceral peril.



Unless you plan your missions well in advance, and have exit strategies and contingency plans, things can descend into chaos in the blink of an eye.

## Rubble rousing

The role of PhysX in *Joint Task Force*

Despite licensing the Ageia PhysX engine, *Most Wanted Entertainment* hasn't been able to fully utilise it. The explosions and fully destructible buildings all crumble satisfyingly dust, but unfortunately have no impact upon the player.

Punching a hole in a Somali tenement in order to dump rubble on the heads of undesirables would be a perfect implementation of the PhysX

hardware. Particle effects are enhanced with the hardware plugged into your rig, but as Vincent says, they're just 'eye-candy'. The problem is that serious physics needs to be implemented from the beginning and *JTF* was originally signed up with a different SDK, which Ageia subsequently absorbed into itself, leading to all sorts of coding changes. Maybe in *JTF2*?





# reviews

All the latest games, gear and apps



## Our scoring system

**0-19%** Unusable or astoundingly rubbish  
**20-49%** Largely not worth spending money on  
**50-69%** Some decent features but uninspiring  
**70-79%** Accomplished without the must-have factor  
**80-89%** Outstanding. Awarded Top Gear or High Score  
**90+** Exceptional. A PCFormat Gold Award winner

## Our key promises

### 1. PCF has the most thorough reviews

We've been reviewing kit and games for 14 years. With over 8,500 reviews written, we have the most talented, dedicated and authoritative teams in the business.

### 2. Integrity is paramount

We never trade pages for exclusives, or review games not signed off as finished by the publisher. Where we've looked at reference hardware, we'll make that clear in the review.

### 3. The PCFormat Gold Award

Only when a piece of equipment or game exceeds our expectations in terms of innovation, excellence and value for money does it get one of these coveted honours.

### 4. High Score/Top Gear

It's a misconception that only 90%+ is an essential purchase. Anything scoring 80% or higher is festooned with one of these, making it one of the month's most highly recommended.

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We are PC fans writing for PC fans, so please share your thoughts on new stuff in our forum: [forum.pcformat.co.uk](http://forum.pcformat.co.uk)



# PCFormat Experts



**JEREMY LAIRD**  
Find out what Jeremy made of the latest crop of flat panel monitors in his exhaustive round-up on page 60.

**MOST WANTED**  
A shiny new monitor



**MIKE ABOLINS**  
Read the latest lovingly crafted musings from *PCFormat*'s very own memory expert over on page 66.

**MOST WANTED**  
Aegia PhysX



**JOHN WALKER**  
Our chief console port reviewer and part-time defender of the digitally oppressed is up to his usual tricks on p32.

**MOST WANTED**  
*Age of Pirates*



**DAVE JAMES**  
Dedicated rig-mangler Dave has had his spanners out again: check out his PC cooling feature on p44 for proof.

**MOST WANTED**  
Even cooler parts



**ALEC MEER**  
Alec's month perked up no end when someone offered to sell him a binbag full of Transformers the other day. What joy!

**MOST WANTED**  
Every robot on Earth



**MIKE CHANNELL**  
Busy month for our Michael, who ploughed through no less than three features and a seven-hour *Quake* match.

**MOST WANTED**  
Sleep

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Dye-sub round-up



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Conroe Extreme Edition



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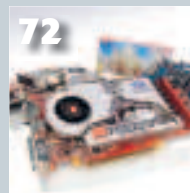
Lambo laptop



104

Flatout 2

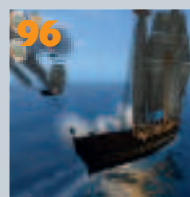
## THIS MONTH



72

### >> GRAPHICS ROUND-UP Great visuals on the cheap

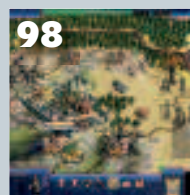
It's a familiar story: the time's come to spend some dough on your beloved rig, and you want to boost performance in the most noticeable way possible. One solution is to plump for a new graphics card, but there are so many around, it makes even our heads spin at times. So, find out which card will give your system much-needed extra pep here.



96

### >> AGE OF PIRATES Tie off that jib, ye lubber

Breathe deep, and let the salty tang of the open waves fill your nostrils – for that way lies fame, fortune, adventure, scurvy and, possibly, agonising disembowelment at the hands of a cutlass-wielding maniac. But hey – fame, fortune and adventure in a sprawling maritime strategy game, eh? Hoist the main brace, someone, and let's set sail.



98

### >> CIV IV: WARLORDS War is always the answer

When *PCFormat* first encountered *Civilization IV*, we'll admit that we weren't struck by the abiding feeling that the game lacked scope. Firaxis had other ideas, though, so behold *Civ IV*'s first expansion. You can expect *Civ*'s patented infrastructure-building, neighbour-riling action, now with added combat options and new, super-hard battle units.

## PLUS

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## FOR MORE REVIEWS...

Check out the *PCF* blog, where we bring you the best-informed opinions of new releases even sooner these young internet upstarts we keep hearing about. Head over to **blog.pcformat.co.uk** for regular updates. On the blog this month, you should find:

>> GTR2 >> Dark Messiah >> A top secret new 3D card...



## PREMIUM PANELS

# Fabulous flatscreens

With LCD prices falling and technology improving so rapidly, there's never been a better time to experience the wondrous world of widescreen.

Jeremy Laird sorts the PVA-powered plonkers from the AS-IPS aces

**O**h brave new world, that hath such panels in't. Verily, the flat-panel LCD monitor has conquered desktops across the land, both at home and in the office.

It's now virtually impossible to buy a new PC with anything but a TFT LCD screen. And why not? Flat panels are brighter, flatter, sharper, more efficient and more compact than their clunky CRT forebears. Hell, they're even healthier to use than those radioactive glass cubes.

The reason for the rapid rise of the LCD, of course, is twofold: improving technology and tumbling prices. Yes, we'll grudgingly concede that mainstream flat panels have yet to match CRTs in two important metrics: response times and colour accuracy. But the gap has now closed to such small proportions that only a tiny number of trigger-happy frag merchants and professional colour pedants could possibly care.

It's also worth noting that emerging technologies such as OLED (Organic Light-Emitting Diode) and SED (Surface-conduction Electron-emitter Display) are

still several years away from being available at affordable prices. Indeed, the only significant change to the PC display that we expect to see over the next few years is the replacement of CCFL backlights in LCD monitors in favour of LED arrays. But again, monitors with LED backlights won't be widely available or affordable for at least 18 months. So, don't be distracted by fantasy-land future technologies. Instead, let's focus on the fact that you can now get a whole hill of LCD monitor for your money.

## DELECTABLE DISPLAYS

Currently, there are a wide range of panel technologies to choose from (see box below), each with its own strengths and weaknesses. What's more, over the past 12 months, large, luxurious widescreen monitors have become a realistic option for those with modest means.

With that in mind, this month *PCF* has brought together a selection of the best alternative 20- to 24-inch displays. Alternative, that is, because Dell's hugely popular 2007WFP and 2407WFP panels are not included. Given the amount of coverage they've already received, those

monitors are known quantities. And, as you'll discover, among our fab five this month there are one or two incredibly desirable alternatives.

Price-wise, our screen selection kicks off at just £275, with a 20-inch display that we reckon represents the first rung on the ladder when it comes to immersive desktop computing. If you're used to a 5:4 aspect 17- or 19-inch panel, the 1,680x1,050 native resolution of a 20-inch widescreener will transform your computing experience. And you won't need a pricey graphics card to drive it; a mid-table video chipset will do.

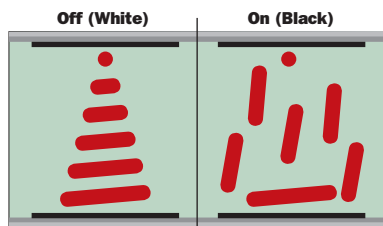
Further up the range, our 23- and 24-inch suspects all offer a native resolution of 1,920x1,200 pixels. That's an incredibly liberating pixel count for multi-tasking desktop duties and crucially it's enough to support the highest 1080p HDTV video standard. Or at least it would be without the thorny issue of HDCP content protection. Of our quintet, only two support HDCP, and one – the Viewsonic 23-incher – bafflingly imposes a 720p limit. It's the only blemish on an otherwise impressive all-round score sheet for this month's fantastic five.

## LCD TECHNOLOGY: THE PROS AND CONS

Nice panel, but how does it work? Funny you should ask that...

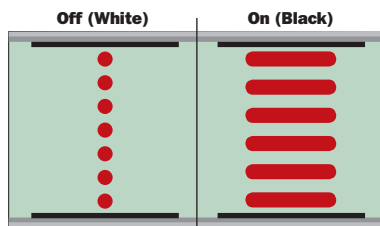
There are many breeds of LCD panel, but all are based on the same underlying principle – manipulating the molecular structure of liquid crystals with an electric charge. Simply put, when the molecular structure of the liquid crystals in an LCD is arranged parallel, or side-on, to the viewing surface, rays from the backlight are blocked and a pixel is effectively off. Twist the liquid crystals around until they're perpendicular to the surface, or end-on, and light is allowed

to pass through, switching the pixel on. The differences are in the fine details of how this is achieved. In TN + Film panels, for instance, the presence of an electric field switches the pixel on. However, IPS technology, which stands for In Plane Switching, the opposite occurs. As the name suggests, the electric field forces the crystals to arrange in-plane (or parallel) with the viewing surface, thereby blocking the passage of light.



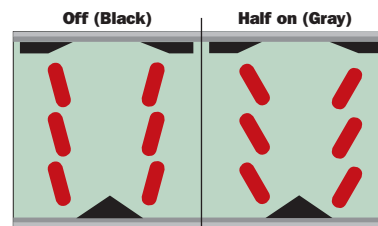
### TN + Film (Twisted Nematic)

A well-established technology, the list of TN + Film's strengths is short but sweet. It's cheap to manufacture and delivers lightning-fast pixel response. Consequently, almost all monitors on the market boasting low single-digit millisecond pixel response are TN + Film equipped. However, in almost all other areas, it's beaten by other technologies. Colour reproduction and viewing angles are particular weaknesses, often producing visible banding when rendering colour gradients.



### IPS (In Plane Switching)

Topping the list of IPS advantages is unbeatable colour accuracy. No other LCD technology comes close. For that reason, all high-end professional LCD monitors calibrated for graphics production sport IPS panels. IPS also boasts wide viewing angles. Historically, IPS panels suffered from poor contrast and light bleed, as well as tardy pixel response. However, the latest S-IPS and AS-IPS (the NEC 20WGx2 is an example of the latter) are much more competitive in these areas.



### MVA & PVA

(Multidomain & Patterned Vertical Alignment) In most regards, MVA and PVA panels are a halfway house between TN + Film and IPS screens. That includes viewing angles, colour reproduction and pixel response. When it comes to contrast and black tone rendering, however, these panels excel. The downside? A loss of detail in darker colours. But the greatest weakness of this technology is input lag. As our test results demonstrate, this makes such panels a poor proposition for gaming.

**KEY** ● Liquid Crystal Molecule ■ Polarizer ■ Glass Plate ■ Electrodes ▲ Protrusions



## Acer AL2416Ws

**£570**

Manufacturer Acer Web [www.acer.co.uk](http://www.acer.co.uk)

**58%**

A false economy made manifest in plastic and TFT LCD – we hereby give you Acer's AL2416Ws. Part of the blame for this ill-conceived monitor lies with the utterly ridiculous import duty that currently applies to any display with a DVI port that dares to breach the UK's borders. It explains why Acer has shipped a 24-inch widescreen PC monitor with just a single unprepossessing VGA video connection.

But it's absolutely no excuse for the offensively drab tilt-only chassis, hewn from brittle plastic and about as confidence-inspiring as a catflap in a tornado. Pull the trigger on this monitor to the tune of nearly £600 and we suspect the disappointment upon unsheathing will be palpable.

Of course, we'd forgive all that in a flash in return for top-notch image quality. But despite the use of A-PVA technology, the AL2416Ws suffers from poor contrast, bleeding black tones and fairly horrific input lag. Avoid.







## Samsung SM244T

**£715**

Manufacturer Samsung Web [www.samsung.co.uk](http://www.samsung.co.uk)

**70%**

Oh so close. And yet oh so far. There's an awful lot to like about this 24-inch Samsung display. On paper, it's the perfect foil for Dell's 2407WFP, thanks to a near enough identical Samsung-manufactured S-PVA panel, that combines searing brightness and bags of colour with impressively inky black tones and decent pixel response.

Indeed, all-round image quality is excellent, whether it's the impeccably even backlight or the extremely consistent viewing angles. Credit, too, for the great overall feature-set, which includes HDCP support on the DVI port, a host of alternative video inputs and a quality chassis, complete with USB ports. In short, it's a rather nice unit.

But sadly and tragically flawed, too. For the SM244T has an acute case of the lags. The delay, for instance, between moving the mouse and the pointer being updated on screen is easily observable, and makes this monitor feel horribly sluggish at times. For gaming, an utter disaster.

## Viewsonic VP2330Wb

**£970**

Manufacturer Viewsonic  
Web [www.viewsoniceurope.com](http://www.viewsoniceurope.com)

**73%**

Give it up for this month's dark horse contender. This monitor has slipped onto the market with little to no fanfare as a replacement for the VP231Wb, and in many ways it's a dead ringer for its progenitor. The chassis is similar to all 'VP' series monitors – a quality item with almost infinite adjustability. Likewise, the 23-inch diagonal, 1,920x1,200 native and super-fine pixel pitch are extremely welcome repeats of the VP231Wb.

But the big change is the move from IPS to MVA panel technology. That means a major upgrade in contrast performance, improved viewing angles, boosted brightness and a healthy dollop of colour saturation. HDCP support is new, too, although somewhat undermined by an artificial limitation to 720p content.

Add in an extremely smooth anti-glare coating and you have a recipe for rather pleasing static image quality. On the move, however, the wheels begin to fall off. Pixel response is ordinary and significant input lag makes gaming a chore.





## BenQ FP202W

**£275**

Manufacturer BenQ Web [www.benq.co.uk](http://www.benq.co.uk)

**80%**

BenQ will be thanking goodness for minor mercies. You see, we at PCF are sophisticated, discerning aficionados of the finer points of flat panelry. If looks and on-paper specifications alone were judge and jury of our panel proselytising, the FP202W would be a lost cause.

For starters, it's extremely hard to imagine a more anonymous and, frankly, more unimpressive looking 20-inch widescreen monitor. Minimalist to a fault is as generous as we're willing to be. It's not exactly bursting with features, either, thanks to a chassis that supports tilt-only adjustability, a total deficit of expansion ports, video inputs limited to just one VGA and one DVI port and, most worryingly of all, TN + Film panel technology.

But for the money, this is an extremely solid performer on many levels, with good pixel response, decent viewing angles and adequate brightness. Our only major complaint is poor contrast performance. The consequence is a rather washed out overall appearance and significant backlight bleed when rendering black tones.



## NEC 20WGX2

**£405**

Manufacturer NEC

Web [www.nec-display-solutions.com](http://www.nec-display-solutions.com)

**90%**

Clarity, sharpness, vividness, fleetness of pixel and deepness of blacks. This NEC monitor has it all in spades. Whereas most of the other screens on test are jack-of-all-trades sorts that wouldn't look out of place in an office, the 20WGX2 is an unashamedly gaming and multimedia-orientated display. If you can live with the handful of drawbacks that result, the rest is all gravy.

In an unusual move, NEC has chosen to pair the latest AS-IPS technology with a glossy anti-glare coating. With the former delivering first-class colour reproduction and viewing angles and the latter boosting contrast and clarity, the result is breathtaking image quality. The fact that it has perhaps the best pixel response and certainly the least input lag just adds to its appeal. Whether it's games or movies, the NEC puts on a truly spectacular show. The only demerits are annoying reflections from that glossy coating and a relatively stingy feature-set that omits HDCP.





# Voting panels

It's a wrap and time to name and shame

Five monitors, four screen technologies, many moons of testing and a memory card full of digital photos. But what have we learned? Well, the easiest conclusion to draw is simple: don't touch those MVA and PVA-equipped monitors. The input lag they exhibit is irritating enough on the desktop, but the issue escalates to train-wreck proportions when playing fast-paced shooters. It's a problem that monitor manufacturers need to address

sooner rather than later – at least if they want dedicated PC gamers to flock to their wares in the future.

Happily enough, that leaves the two much more affordable 20-inch models. For those on a tight budget, the BenQ FP202W is an extremely respectable option. It's not perfect by any means, but it's streets ahead of most TN + Film

panels, and that wide aspect 1,680x1,050 resolution will be an awesome upgrade for most.

Which just leaves our outstanding winner: NEC's 20WGX2. Admittedly, it's a glossy screen, and for some that will be an instant turn-off (come on, where's your sense of adventure?). But for everyone else, it serves up an

**“The NEC 20WGX2 serves up a bin-busting spectacle”**

unforgettably bombastic and bin-busting visual spectacle. Indeed, you may have heard talk of a

new generation of premium-priced displays capable of High Dynamic Range colour reproduction. Well, thanks to its high contrast, anti-glare coating and cutting-edge AS-IPS panel tech, the 20WGX2 is as close as you'll get to an HDR-capable display for under £5,000. Not bad, considering this one sells for just a whisker over £400!

## Lagging behind

Measuring input lag

Until recently, the number one concern for gamers when bagging an LCD panel was pixel response. However, now a new problem has emerged: input lag. This involves an apparent delay between the output signal from the video card and the resultant screen update on the LCD monitor. Typically, this is noticed in the form of sluggish mouse response on the Windows desktop or 'laggy' mouse inputs when playing games. All LCD monitors suffer from some lag, due to the signal processing required to drive a matrix of individual pixels but, as our results show, MVA and PVA panels exhibit enough lag to cause serious gaming problems.

Our methodology for assessing lag is simple but ingenious. We paired our monitors with a CRT in clone mode (CRT monitors exhibit virtually no lag) and ran a digital timer application accurate to a thousandth of a second. We then set the timer running, taking a single picture of both panels with a fast digital camera and comparing the results. The monitor with more lag will display less time elapsed, and vice versa for the less laggy panel. Clever, eh?



LAG TEST RESULTS	AVERAGE	MAXIMUM
ACER AL2416WS	52ms	61ms
SAMSUNG SM244T	45ms	66ms
VIEWSONIC VP2330WB	24ms	41ms
BENQ FP202W	14ms	21ms
NEC 20WGX2	12ms	22ms

## IN DETAIL Looking for perfection in every aspect

**£570**

**Acer  
AL2416WS**

**58%**



**£715**

**Samsung  
SM244T**

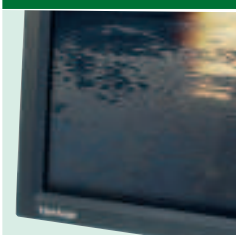
**70%**



**£970**

**Viewsonic  
VP2330WB**

**73%**



**£275**

**BenQ  
FP202W**

**80%**



**£405**

**NEC  
20WGX2**

**90%**



SCREEN DIAGONAL	24 inches	24 inches	23 inches	20 inches	20 inches
NATIVE RESOLUTION	1,920x1,200	1,920x1,200	1,920 1,200	1,680x1,050	1,680x1,050
PANEL TYPE	A-PVA	S-PVA	MVA	TN + Film	AS-IPS
BRIGHTNESS	500cd/m2	400cd/m2	250cd/m2	300cd/m2	470cd/m2
CONTRAST	1,000:1	1,000:1	800:1	600:1	700:1 (1,600:1 in Advanced DV mode)
PIXEL RESPONSE	6ms (g to g)	6ms (g to g)	8ms (g to g)	8ms (not specified)	6ms (g to g)
VIEWING ANGLES	178/178 (cr10)	178/178 (cr10)	170/170 (cr10)	140/130 (cr5)	178/178 (cr10)
INPUTS	VGA	VGA, DVI (HDCP), component, composite, S-Video, USB	VGA, DVI (HDCP), USB	VGA, DVI	VGA, DVI
PCF SAYS	“No DVI connectivity, but poor image quality is the killer blow”	“An otherwise great display ruined by severe input lag”	“An intriguing option, but expensive and sadly a little laggy”	“An impressive performance from an affordable 20-incher”	“Pricey for a 20-inch panel, but packs a massive visual punch”



## HOW WE TESTED

### Memory matters

We used a 2.6GHz Conroe processor in Asus' P5W DH Deluxe socket-775 mobo, along with an NVIDIA NX7900GT and Hitachi Deskstar 7K500 S-ATA hard drive in the tests. Running Windows XP Professional, we tested 1GB of RAM from the four manufacturers. We tested either pairs of 512MB DIMMs or 1GB sticks. Dual-channel matched DIMMs are

preferable, but we installed the 512 modules on the same channel to avoid tipping the results. We fired up *Quake IV* and *F.E.A.R.* before running the RAM through SiSoft Sandra's memory bandwidth benchmark. Each DIMM was run at DDR2-667, DDR2-800, and at the DIMMs' shipping latencies, and then at DDR2-1066 at latency timings of 5-5-5-15.

# Fading memory

Mike Abolins **discovers that memory speeds are rising, but so is latency. So is the pay-off worth it?**

**R**AM has always been the quiet contributor to your system's performance, overshadowed by processors and graphics cards that continually increase the grunt. Time was, as long as you had a gigabyte or more to plug into your motherboard, you were pretty much safe. But with CPU and GPU speeds increasing, RAM speeds are rising, too.

On paper this sounds like a sensible idea, except that as RAM frequency increases (this is rated in MHz, much like CPUs), so does latency. Latency, simply put, is the amount of time (usually very small fractions of a second, but it makes a difference) that it takes for data to be stored and then loaded from RAM, and it's a particular problem with DDR2 RAM as it has to be run at such high speeds.

However, with memory manufacturers offering low-latency DIMMs for performance PCs, the frequency that RAM is run at can now be raised without the detrimental effects. While the latency still rises, the increased bandwidth resulting from the higher frequency means that gains in data throughput are still worthwhile. As a result, you

can take a low-latency DIMM and, as long as it's adequately cooled, overclock it. With DDR2-1066-capable motherboards for Intel and AMD's new babies, Core 2 Duo and AM2, it's a point worth investigating – especially as several RAM manufacturers have told us that their 800MHz sticks will happily run at 1,066MHz, providing you relax the latencies.

### TIME IS MONEY

Of course, you're going to have to pay a price for low latency RAM. So is the boost in performance worth it? Considering that the heatsink-clad 'gamer specials' can cost anywhere between 10% and 30% more than the standard DIMMs, you're going to have to be sure that you're going to see a return on your investment.

Oh, and a word to the wise: it's still up for debate whether the latest new-fangled heat-spreaders are actually any practical use. DDR2 memory chips are manufactured using 110nm or 90nm processes, and they generate very little heat, even when overclocked. It's only when you press past the 1GHz barrier (as Corsair has done

recently with its expensive, actively-cooled DDR2 modules) that heat becomes a serious, performance-sapping issue. But we digress; let's get to the business at hand, and find out which of the latest RAM sticks can deliver a combination of power and speed... **PCF**

## What is EPP?

Time-saving tech explained

Enhanced Performance Profiles (EPP) is a system developed by NVIDIA and Corsair to enable memory to be run at lower-than-standard latencies. Designed to work specifically with the NFORCE5 chipset, EPP is essentially an extension of the standard Serial Presence Detect function found on any DIMM (by which the RAM tells the system which latency and speed it should be running at). EPP DIMMs come with extra speed, latency and voltage profiles so you can simply switch to enhanced performance without the hassle of incremental BIOS overclocking. While Corsair has spearheaded the system, it's an open-source project and more memory manufacturers are soon expected to follow suit.



## Ballistix

**£117.49** (2 x 512MB)

Manufacturer Crucial Web [www.crucial.com/uk](http://www.crucial.com/uk)

Crucial has always been a name to trust when it comes to memory, largely thanks to the fact it makes its own chips.

At 800MHz, the Ballistix modules does perform slightly better than most of the competing brands, and at 1,066MHz, it shows a minor pickup of an average 1-2FPS in tests. Due to it running happily at a higher voltage (2.2V) out of the box, it also necessitated less tweaking in the BIOS, making it a candidate for easy and stable overclocking that'll suit less-experienced tinkerers, and those wishing for a quick-fix of extra speed without the hassle. However, the performance gains made by going from 800MHz to 1,066MHz at higher latencies are still comparatively small.

Type PC6400

Native speed 800MHz

Native latency 4-4-4-12

Native voltage 2.2V

**84%**

PCF says... "The Ballistix memory is great for first-time modders."

top  
gear  
PCFormat

## ValueRAM

**£96.29** (1 x 1GB)

Manufacturer Kingston Web [www.valueram.com](http://www.valueram.com)

The cheapest-looking memory on test, Kingston's ValueRAM uses other manufacturer's memory chips but actually weighs in, at the time of writing at least, as the most expensive single DIMM. It also has the least amount of headroom to play with out of the box, so this won't appeal to obsessive overclockers.

Running the ValueRAM to 1,066MHz at the required latencies of 5-5-5-15 proved too much for it, and it just wouldn't stabilise. And even at its rated speed of 800MHz, it was down by several frames per second in our gaming tests. Out of the box, there's cheaper RAM available that not only adds noticeable extra game speed, but runs at the higher 1,066MHz FSB speed to bring more joy to your Conroe or AM2 system. With all this in mind, it's hard to recommend the Kingston ValueRAM.

Type PC6400

Native speed 800MHz

Native latency 4-4-4-12

Native voltage 1.8V

**68%**

PCF says... "Budget by name and nature. Poor overclocking results."

## Low-latency RAM

	FE.A.R. @ DDR2-800 4-4-4-12	FE.A.R. @ DDR2-1066 5-5-5-15	QUAKE 4 @ DDR2-800 4-4-4-12	QUAKE 4 @ DDR2-1066 5-5-5-15	SISOFT BANDWIDTH BUFFERED @ DDR2-800 4-4-4-12	SISOFT BANDWIDTH UNBUFFERED @ DDR2-800 4-4-4-12	SISOFT BANDWIDTH BUFFERED @ DDR2-1066 5-5-5-15	SISOFT BANDWIDTH UNBUFFERED @ DDR2-1066 5-5-5-15
CRUCIAL BALLISTIX	57.8fps	58.9fps	88.7fps	90fps	4696MB/s	8143MB/s	4761MB/s	8312MB/s
KINGSTON VALUERAM	52.2fps	N/A	81.9fps	N/A	4581MB/s	7931MB/s	N/A	N/A



# Low-latency RAM

## XMS2 6400C

**£81.66** (1 x 1GB)

Manufacturer Corsair Web [www.corsairmemory.com](http://www.corsairmemory.com)

Corsair is the memory you want if you're after the last drop of performance. Not only did the company set up 2GB's worth of PC2-6400 DDR2 memory to run at 1,250MHz at Comdex, it used the same DIMMs that we're using here.

Indeed, if you're a keen overclocker this is one of the brands to strongly consider. Although we ran it at DDR2-800 using our standard latency of 4-4-4-12 (a fairly conservative setup), Corsair tests the memory at 3-4-3-9 so you're guaranteed a boost, and at 1066MHz at 5-5-5-15, it provides a small rise over 800MHz. The Corsair memory is also the only one to support Enhanced Performance Profiles, to more easily enable overclocking.

Type PC6400

Native speed 800MHz

Native latency 4-4-4-12

Native voltage 2.2V

**92%**

PCF says... "The ultimate in DDR2 memory technology."

gold  
PCFormat

## OverClock memory

**£112** (1 x 1GB)

Manufacturer Super Talent

Web [www.supertalentmemory.com](http://www.supertalentmemory.com)

The silly-sounding Super Talent is another that uses heat-spreaders on its chips, but unlike Crucial's clip-on affairs, these use a layer of thermal paste to achieve better contact.

Of more interest is the fact that the Super Talent RAM sits alongside the Corsair memory in the top tier of performance. There's far less documentation than with other manufacturers, though, so you are somewhat in the dark in regards to how far you can push it. Starting at 1.8V, we found that the speed could be upped to DDR2-1066 by increasing the juice to 2V. This was achieved by increasing latency timings to 5-5-5-15, though Super Talent assures us that tighter latencies are still possible, though.

Type PC6400

Native speed 800MHz

Native latency 3-4-3-8

Native voltage 1.8V

**88%**

PCF says... "A decent budget alternative to Corsair chips."

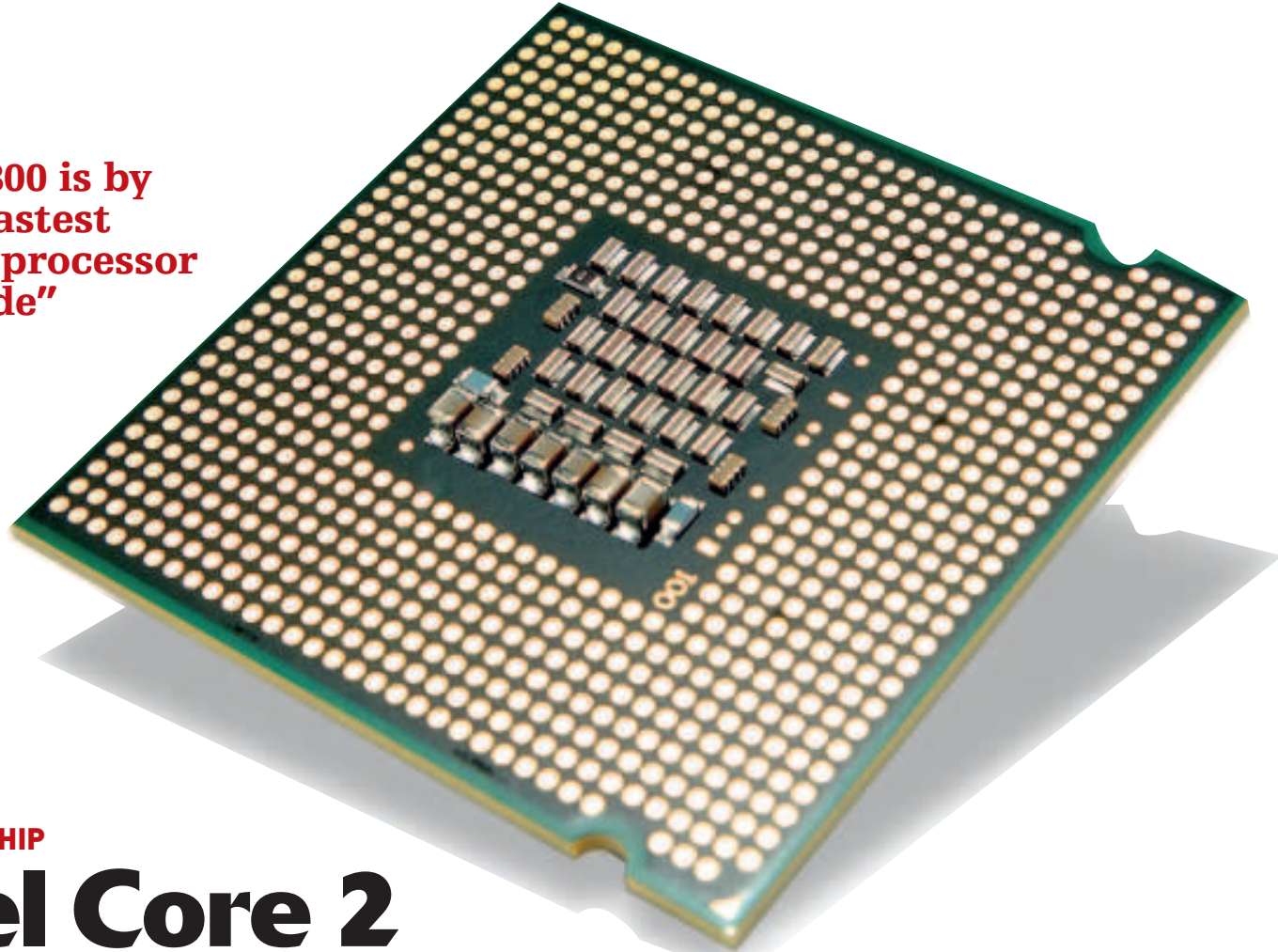
top  
gear  
PCFormat



	F.E.A.R. @ DDR2-800 4-4-4-12	F.E.A.R. @ DDR2-1066 5-5-5-15	QUAKE 4 @ DDR2-800 4-4-4-12	QUAKE 4 @ DDR2-1066 5-5-5-15	SISOFT BANDWIDTH BUFFERED @ DDR2-800 4-4-4-12	SISOFT BANDWIDTH UNBUFFERED @ DDR2-800 4-4-4-12	SISOFT BANDWIDTH BUFFERED @ DDR2-1066 5-5-5-15	SISOFT BANDWIDTH UNBUFFERED @ DDR2-1066 5-5-5-15
CORSAIR XMS2 6400C	58.2fps	59.4fps	89.4fps	90.8fps	4713MB/s	8223MB/s	4795MB/s	8389MB/s
SUPER TALENT O/C MEM	58.9fps	59.5fps	87.3fps	89.8fps	4655MB/s	8121MB/s	4972MB/s	8403MB/s



**"The x6800 is by far the fastest desktop processor ever made"**



## CHAMPION CHIP

# Intel Core 2 Extreme Edition X6800

Intel's hideously fast new flagship processor has the measure of AMD's finest. But is it worth the price premium?

**Price** £775 **Manufacturer** Intel **Web** [www.intel.com](http://www.intel.com)

**B**rand new chip. Same old problem. Last issue, we snagged some face time with Intel's Core 2 Duo processor. The result? We couldn't have come away more impressed. Core 2 Duo slapped the opposition around in every way that matters, including performance, operating temperatures and even pricing.

But that was the sensible money members of Intel's new desktop CPU family. This month, the chip giant has wheeled out the near-£800 flagship of the Core 2 range – the Core 2 Extreme Edition X6800. And like almost every other range-topping CPU, the X6800 represents naff value for money.

Fundamentally, it's the same chip as the much cheaper E6700 model which performed so well in our original benchmarks. So, it's packed with a virtually identical set of Athlon 64-bashing features, including a dual-core

architecture, topped with 4MB of shared L2 cache, a four issue-wide instruction core and massively enhanced SSE instruction handling.

### PREMIUM PRICING

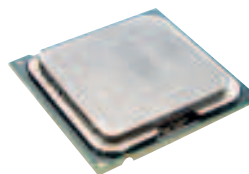
Indeed, it differs only in offering an overclocking-friendly unlocked CPU multiplier and a bump in clockspeed from the E6700's 2.66GHz frequency to 2.93GHz. Not much, considering the £350 price premium Intel is charging. Making matters worse, Intel has also announced a Xeon-branded workstation variant of this chip which sports a 3GHz clockspeed and 1.33GHz system bus frequency (the X6800 runs the same 1,066MHz bus as all other non-Extreme Edition Core 2 desktop chips). And all for around £75 less than the X6800.

But if our review sample is anything to go by, the ultimate insult is its overclocking potential. 3.3GHz was the

most we could squeeze out using a standard air cooler and voltages. Our 2.66GHz E6700 managed 3.2GHz using the same setup.

The X6800 is by far the fastest desktop processor ever made. It absolutely *flattens* AMD's Athlon 64 FX-62, while remaining cool, calm and collected throughout. The Core 2 Duo range should be at the top of your shopping list if you are considering an upgrade. But pretty please, steer clear of this Extreme Edition, it's just not worthy of your hard-earned.

**Jeremy Laird**



This monster floored its rivals in our tests.

<b>Core configuration</b>	Dual-core
<b>Clockspeed</b>	2.93GHz
<b>Socket</b>	LGA775
<b>Processor technology</b>	65nm strained silicon
<b>L2 cache memory</b>	2MB
<b>Instruction pipeline</b>	14 stages
<b>64-bit data support?</b>	Yes
<b>Power rating</b>	85W

**Motherboard chipset support** Intel 965, 975, NFORCE 570, 590, ATI Xpress 3200

BENCH MARKS	PCMARK05	SISOFT SANDRA MEMORY BANDWIDTH (MB/s)	H.264 1080P VIDEO DECODE (CPU time)	WMV9 VIDEO ENCODE (m:sec)	HL2: LOST COAST (FPS)	FAR CRY (FPS)
<b>X6800</b>	<b>7,475</b>	<b>5,161</b>	<b>30%</b>	<b>01:41</b>	<b>165</b>	<b>126</b>
<b>FX-62**</b>	<b>6,338</b>	<b>7,681</b>	<b>39%</b>	<b>02:01</b>	<b>120</b>	<b>94</b>

More benchmarks and details can be found on your DVD

**75%** **PCF says...** "Performs well, but much better value is available elsewhere in the Core 2 range."



Photos Philip Sowels

## SUB-£200 3D CARDS

# Mid-range minefield

Achtung! Meinen! Watch where you tread, the mid-range can be a dangerous place. *PCF's* top sapper, Al Bickham, clears a path...

**O**ne thing guaranteed to help you make a 200-quid blooper when it comes to improving your PC's graphics punch (and on a budget) is today's video card naming conventions. After NVIDIA's 6800GT came ATI's X800GT – like the X800XL, but with disabled pipelines. Then NVIDIA got in on the act with the 7-series cards, and started adding the letter X to card suffixes, ATI's old trademark letter. Now we have GTXs and GX2s fighting GTOs and XTXs. If only someone would take them by their collective collars, dispense withering slaps, and tell them to belt up.

This is partly why buying a new graphics card can be such a nightmare. There's a squealing great menagerie of cards, and you simply can't distinguish wolf from sheep by name alone. The

marketplace is muddier than a farmer's welly, and twice as smelly at the bottom. Is a 7600GT better than an X1800GTO? And where does the 7600GS fit into the

**“Here you'll find the price/performance sweet spots of the graphics card world”**

equation? Is it faster or slower? Should you just pack it all in right now and go and live in a yurt?

Of course not! There are some great cards around at the moment, at prices that make far, far more sense than those at the stratospheric high end. This price bracket contains the price/performance sweet-spots of the graphics card world and, as ever, if you shop around the retailers, there are

plenty of bargains to be had. What's more, several of the cards we'll look at shortly appear to offer an upgrade path, in the shape of CrossFire and SLI. However, it's worth bearing in mind that particular iterations of a card offer less longevity than others, and as time goes by, VGA BIOSes are updated, so a card that's to all intents and purposes identical to the one you bought six months ago may actually be incompatible without a BIOS flash.

### EASY SOLUTION

The simple answer is this: if you're planning to upgrade your system with a second VGA card, don't leave it longer than, say, a few months, and keep a beady eye on who's selling what in the interim, so you're fully in touch with how the market is advancing. But before you



# Dual VGA in the mid-range

CrossFire and SLI will double your outlay. Is it really worth it over a single high-end card?

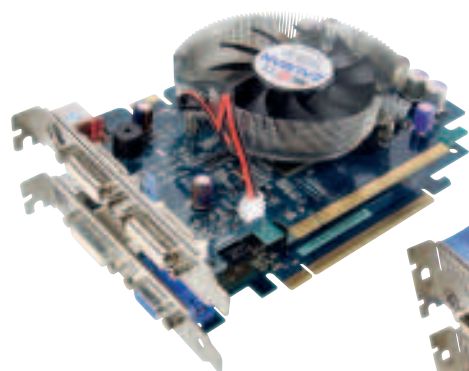
At the time this article goes to press, SLI is your only real dual-card option in the mid-range. CrossFire, ever the slippery whippet of the dual-card setups, is pretty much a dud at this level. The X1800GTO does work in CrossFire mode... or so we've been told by certain card manufacturers. However, even after installing the beta drivers, tucked away under a rug on ATI's driver site, we lost four hours of our lives trying to make the setup work. But no dice; it really didn't want to play ball.

Theoretically, the X1900GT should work in CrossFire mode, too, and, like the X1800GTO, without the necessity for a clumsy external link-cable. However, drivers that

enable CrossFire for the X1900GT aren't available yet, even in beta form. Which is crazy, as the X1900GT is a cracking card for the price – the equal of the 7900GT in many games, superior in heavy-duty shader shifters like Oblivion, but with ATI's superior distance-rendering and overall image quality as a deal-sweetener. Come on, ATI. Get your act together. Once again, CrossFire loses out to the flawless simplicity and elegance of SLI. ATI really needs to pull its finger out in this regard.

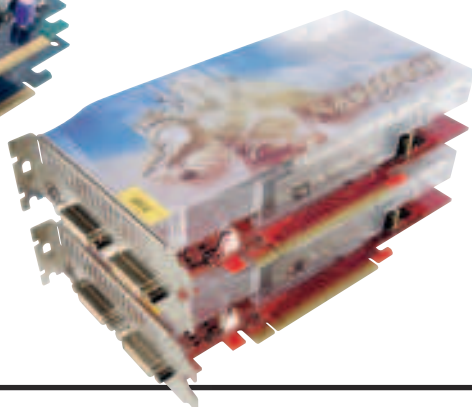
No lumpy external cable-link, no fiddly beta drivers... SLI just works, so if you want to pair a 7600GS, GT or 7900GT with a twin, it's easily done. However, the

price doesn't always add up, so watch your pennies carefully. A pair of 7600GTs is indeed comparable to a single 7900GT, but a pair of 7600s will cost you more than a single 7900GT. And here's the rub for the high end: the new 7950GX2 high-end dual-VGA card from NVIDIA will cost you the same as a pair of 7900GT cards (around £370), and will outperform them by a good margin. Moreover, it can be overclocked to run at 7900GTX SLI levels, for a fraction of the price. Right now, the dual-card price/performance sweetspot for the entire graphics card market rests with a single high-end card: the 7950GX2.



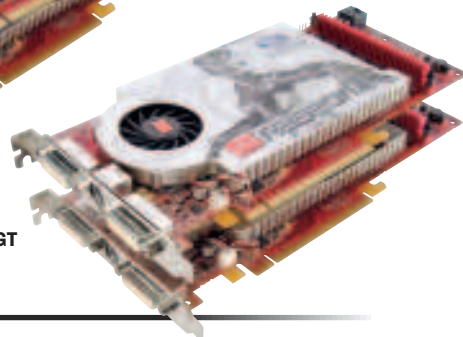
Two 7600GTs may equal one 7900GT, but they cost more.

SLI just works: pair up the 7600GS for a superior experience.



No external link-cable is required for the sterling X1800GTO.

CrossFire-enabling drivers for the X1900GT aren't yet available.



make that dual-card decision, read our specially tailored 'Dual VGA in the mid-range' panel (above).

Yes, we know buying a card can be confusing. But it's PCF's aim to sweep away this confusion in the cleansing wind of the scientific method. In the following pages, we'll benchmark the current crop of mid-range cards – those between £100 and £200 – and tell you what's hot and what's not.

Do bear in mind, though, that we're dealing with ATI's X1000-series and the latest cards in NVIDIA's 7-series, so we've left out the ailing 800s and 6-series cards. With the Shader Model 3.0 pixel-poke offered by today's entirely affordable cards, you really shouldn't be looking that far back.

It's also worth noting that the upper echelons of these mid-range cards – namely, the X1900GT and 7900GT – offer superb performance at the standard flat-panel native res of 1,280x1,024, and if that's what you have, there's really no sense in plumping for a fatter card. Major dual-card setups – such as X1900XT CrossFire and 7900GTX SLI – are just a waste of your good gold, unless you're playing at seriously high resolutions. In fact, they can even perform worse than their single-card equivalents at 1,280x1,024,

owing to the CPU overhead required to run a pair of cards.

## MID-RANGE SPLENDOUR

But back to the mid-range. The selection on offer here comprises a variety of VGA chipsets, most of which are slightly nobbled versions of original high-end GPUs. As time passes, and more and more chips come off the production lines, manufacturers build up stocks of slightly less able chips – ones in which the pipeline count has dropped from 16 to 12, because of, say, a fault in the silicon. These wonky cores then get rebadged with a new suffix, bolted on to a PCB with the optimum amount of RAM, a new BIOS and a smaller heatsink, and sold as mid-range cards.

The X1900GT is a textbook example; with 12 pipes instead of 16, it's less able than the X1900XT, although it still offers plenty of poke. In a number of cases, you can re-flash a card such as this with its big brother's BIOS, and re-enable that last quad of pipelines.

However, most of these GPUs simply have broken pipes, and a BIOS flash achieves nothing, so it's really down to the luck of the draw. And bear in mind that if you flash your BIOS and it all goes south, you'll void the manufacturer's warranty. On with the show...

**"If you flash your BIOS and it all goes south, you'll void the manufacturer's warranty"**

## HOW WE TESTED

We spanked them 'til they cried...

These cards aren't designed to tear along at huge resolutions, so for the majority of us the most important number you'll see in the benchmarking is 1,280x1,024 – the standard native resolution of today's 17-inch and 19-inch flat-panel monitors. We also ran tests at 1,600x1,200 for comparison – not only to show how much playability you can expect, but also to illustrate which graphics cards start running out of pump at higher resolutions.

Benchmark-wise, we ran the obligatory 3DMark06 HDR test (all these

cards are SM3.0 friendly) and a battery of three more game tests – *Oblivion*, *F.E.A.R.* and, of course, *Half-Life 2: Episode One*. These we ran at the aforementioned resolutions with, where applicable, 2x Anti-Aliasing and 4x Anisotropic Filtering.

Point of interest – we rejected the inclusion of the X1600XT in this group test, because it underperformed so badly compared with all the other cards. Sorry to say, but it just isn't in the same class and you shouldn't even consider it for gaming.



# HEAD-TO-HEAD



TRUE GEM

## Sapphire X1900GT



A cut-down X1900XT GPU, on a slim board with a quiet fan. What's not to like?

Price £180 Manufacturer Sapphire Web www.sapphiretech.com

**O**n balance, the X1900GT remains neck and neck with the other big card in this race, the 7900GT – and with good reason. It's based on the R580 GPU, the chip that goes into the powerful X1900XT and X1900XTX – albeit with half the memory, pared-down clockspeeds and a quad of its 16 pixel-pipelines disabled. But just because it's a slightly reduced version of its big brother, there's no call to dismiss it. In fact, by our reckoning, it's the brightest pupil in the class, outperforming many of its rivals in several key areas.

### SUPERIOR SHADER

With the core running at 575MHz and the memory at 1200MHz, it trots along faster than the similarly specced 7900GT, and the performance gap is telling. While it offers comparable performance in most areas, with the 7900GT actually licking it by a few points in 3DMark06, ATI's superior shader-handling makes its presence clearly felt in *Oblivion*. And while the difference is only 8 frames per second at 1,280x1,024 (not much, you might say), the game actually feels smooth rather than jerky – unlike every other card on

test here. That's the difference between irksome and playable.

It's hard not to love the X1900GT. That intimidating X1900XT parentage goes a hell of a long way, and this young pup definitely flexes a measure of his father's muscle. What's more, it's cheaper than the 7900GT – its closest competition in this test.

About the only downside is that you can't CrossFire a pair of them, at least not yet, as the Catalyst drivers don't support it in dual-card mode. And that's where the 7900GT should become more appealing – but for the fact that a pair of them costs the same as a 7950GX2, which offers superior performance. If your budget is £200 and you're looking for a single card, the X1900GT is it.

<b>GPU</b>	R580
<b>Memory</b>	256MB GDDR3
<b>Core speed</b>	575MHz
<b>RAM speed</b>	1200MHz
<b>Pixel pipelines</b>	12
<b>API support</b>	DirectX 9, OpenGL2.0
<b>Shader support</b>	HDR, SM2, SM3
<b>AV-out</b>	DVI x2

**89%** PCF says... "No other sub-£200 card can do what this baby does."

## WORTHY SECOND

# Verto 7900GT

NVIDIA's most powerful mid-range effort is undone by ATI – and NVIDIA itself...

Price £220 Manufacturer PNY Web www.pny.com

**T**wo months back, we'd have recommended the 7900GT almost without reservation. It offers smart performance, is significantly cheaper than the current crop of top-end cards, and proffers a streamlined plug-and-play upgrade path, via SLI, to hi-res pleasures.

Between then and now, however, two main factors have combined to throw a spanner in its works. For one, the X1900GT, which, you'll note from the benchmarks, outperforms the 7900GT in *Oblivion* by a decent percentage and costs, on average, £20-£30 less. As far as single cards go at this sort of price bracket, the balance is clearly tipped in favour of ATI's effort.

better, cheaper single and dual-card setups on offer.

However, if there's one factor that can really change our opinion of any card, it's pricing. With NVIDIA expected to announce its 8-series cards soon, you can expect these mid-rangers to drop in price sharpish. If we see £40 or more knocked off the 7900GT – or some exclusive SLI bundles from retailers – it's going to become a hot prospect again. But until that time, there are shrewder ways to spend your money. As it stands, the market's moved, and the 7900GT has remained still; compared with the cards around it, it's just a bit too expensive for the performance you obtain.

## NOT TWICE THE FUN

So the upgrade path, then, would appear to be the only reason to consider the 7900GT; get a pair of these in SLI and you'll have no bones with performance. But again, there's a problem: NVIDIA's 7950GX2 costs around the same as a pair of these – even less, if you compare it to the pricier 7900GTs – and offers higher performance through a single slot. All of which leaves the 7900GT, despite its impressive abilities, hanging in the wind. There are

<b>GPU</b>	G73
<b>Memory</b>	256MB GDDR3
<b>Core speed</b>	450MHz
<b>RAM speed</b>	800MHz
<b>Pixel pipelines</b>	24
<b>API support</b>	DirectX 9, OpenGL2.0
<b>Shader support</b>	HDR, SM2, SM3
<b>AV-out</b>	DVI x2

**82%** PCF says... "A solid performer, but not the best value choice."







LOW-END MARVEL

## MSI NX7600GT

The 7900GT's little bro' may be small on numbers, but he's big on brains

Price £130 Manufacturer MSI Web www.msicomputer.com



**T**he diminutive member of NVIDIA's 7-series family is one of the best low-end cards ever released. Picking up where the 6600GT left off, it offers good value for money and reasonable performance for the price. And while this model from MSI is a little pricier than others, owing to the chunking great heatsink straddling it, we've seen vanilla models going for as cheap as £110. In addition, we've heard great things about the overclocking potential of the 7600GT, and this two-slot model, while clocked faster than a vanilla 7600, can probably be pushed even harder.

### BLISTERING SPEED

As it stands, this particular iteration of NVIDIA's G73 core features fairly blistering clockspeeds of 580MHz on the core and 1400MHz on the RAM, but the pipeline count is a mere 12 – literally half that of the GT and GTX models – so, as you might imagine, the performance is far from stratospheric. Capable and agile is probably a better way of describing it.

It offers entirely playable framerates at standard resolutions in pretty much everything bar

*Oblivion*, which, as we all know, even thrashes the polka-dotted knick-knacks off a pair of X1900XTs in CrossFire.

You know the score, though. Drop the settings and it's totally playable. Moreover, 58fps in *Half-Life 2: Episode One* at 1,280x1,024 with HDR is all most of us need to get the job done in shiny fashion, and 45fps in *F.E.A.R.* at the same resolution is just fine, thanks very much.

There's even the option of an SLI pairing, but, to be honest, until the 7600GT drops below the £100 mark (or you pester a gin-soaked relative for another one come Christmas), it's just not worth it. You'll achieve comparable performance from a single 7900GT for considerably less outlay.

<b>GPU</b>	G73
<b>Memory</b>	256MB GDDR3
<b>Core speed</b>	580MHz
<b>RAM speed</b>	1400MHz
<b>Pixel pipelines</b>	12
<b>API support</b>	DirectX 9, OpenGL2.0
<b>Shader support</b>	HDR, SM2, SM3
<b>AV-out</b>	DVI x2

**81%** PCF says... "Pretty much the best card there is near the £100 mark."

### POWER CHIP

## Powercolor X1800GTO

Cheap and cheerful gap-plugger

Price £130 Manufacturer Powercolor Web www.powercolor.com

**A**nother example of a mature GPU that's come off the production line with a reduced pipe-count, the X1800GTO is a 12-pipe version of the 16-pipe R520, which first saw the light of day in ATI's Radeon X1800XT. On its initial release, the card was both undercut and outperformed by NVIDIA's competing 7800GTX, and was a waste of £350; now, at £130 for a

touch less power, it's looking a damn sight tastier.

It's an awfully close-run thing between this and the slightly faster 7600GT, and, to be honest, if you took The Pepsi Challenge, you really wouldn't know which one you were using. The 7600GT just pips it to the post in the definitive benchmarks, though, so that's where our loyalties lie.

<b>GPU</b>	R520
<b>Memory</b>	256MB GDDR3
<b>Core speed</b>	500MHz
<b>RAM speed</b>	1,000MHz
<b>Pixel pipelines</b>	12
<b>API support</b>	DirectX 9, OpenGL2.0
<b>Shader support</b>	HDR, SM2, SM3
<b>AV-out</b>	DVI x2

**80%** PCF says... "Good performance for £130, but the 7600GT works



### STAR PERFORMER

## Galaxy 7600GS

A letter short of the GT, yet nearly as good

Price £103 Manufacturer Galaxy Web www.galaxytech.com

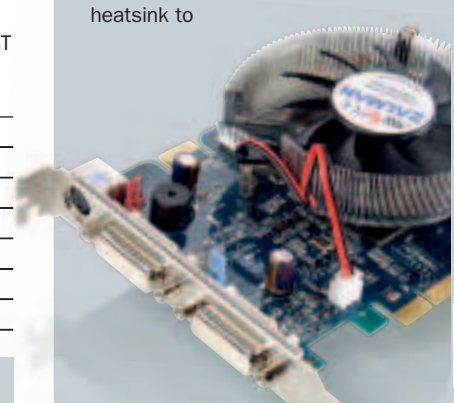
**T**he standard 7600GS is a slower-clocked version of the 7600GT, featuring GDDR2 memory instead of GDDR3. However, Galaxy has upgraded those specifications to make their card closer to the 7600GT, and it shows in the benchmarks. The card also features an efficient-yet-quiet Zalman heatsink to

allow for some overclocking headroom. Handy, that.

It's not yet available in the UK, but you can order it from European sites for 150 Euros (around £103), which makes it a bargain, as it's so close to the 7600GT in the performance stakes. The GT and X1800GTO are still better prospects if it's performance out of the box you're after, though.

<b>GPU</b>	G73
<b>Memory</b>	256MB GDDR3
<b>Core speed</b>	500MHz
<b>RAM speed</b>	1,400MHz
<b>Pixel pipelines</b>	12
<b>API support</b>	DirectX 9, OpenGL2.0
<b>Shader support</b>	HDR, SM2, SM3
<b>AV-out</b>	DVI x2

**78%** PCF says... "A bargain at £100, but an extra £30 nets you the GT."



Turn over for the full benchmarks

# Pushed to the limit

We work this capable fivesome into a pixel-popping sweat

KEY

Galaxy 7600GS

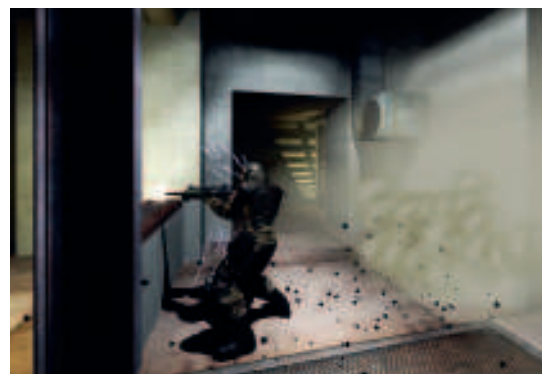
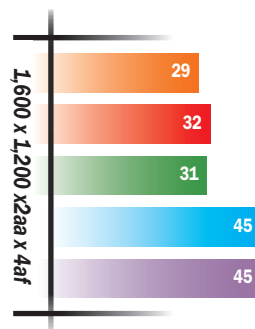
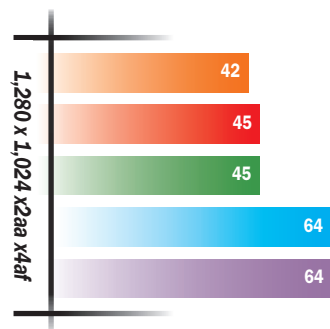
MSI NX7600GT

Powercolor X1800GTO

Sapphire X1900GT

Verto 7900GT

## F.E.A.R.

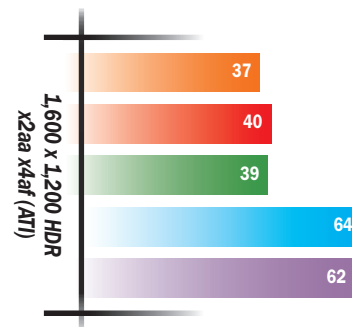
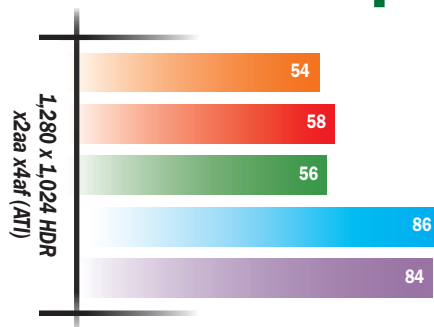


F.E.A.R.: Heavy shader-work is a good challenge for cards.

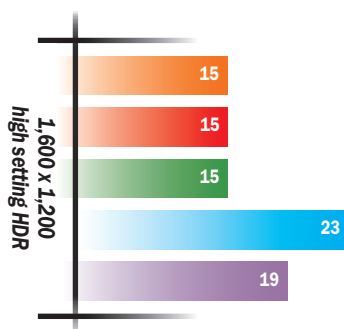
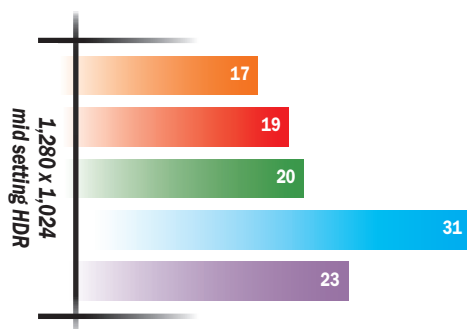


Half-Life 2: Episode One: A top faux-HDR and Anti-Aliasing test.

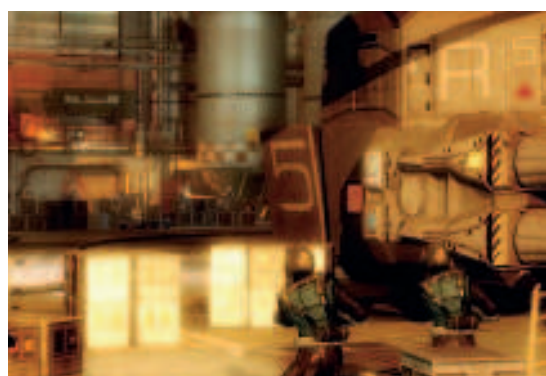
## Half-Life 2: Episode One



## Oblivion

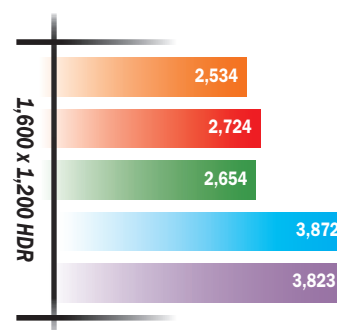
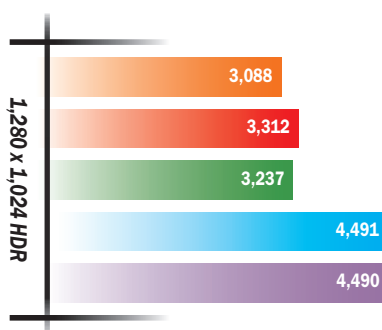


Oblivion: A nightmare of a game for every card on the market.



3DMark06: Useful for comparison, but not always reliable.

## 3DMark06





# Cooler than thou

There's an elegance and power to mid-range cards that you just don't find at the high end

**H**igh-end graphics cards may knock out mental framerates at colossal resolutions, but there's a price: heat generation. And the only way to economically dissipate that heat is by using chunking great coolers and fans. This is why today's high-end cards are double-width affairs, taking up two rear panels on your PC. Barely an issue of *PCFormat* goes by where we don't knock the X1900XTX for being a big, noisy bastard of a card. There, you see? We just did it again.

However, even the two top performers in our mid-range tests, the 7000GT and the X1900GT, both have vastly reduced heatsinks, which keep the size and the noise to a minimum. In addition, both these GPUs are reduced versions of those in the top-end cards;

just shows how much less cooling they need compared to their bigger brothers.

All the cards on test here run cool and quiet, and one in particular even has a better-than-stock cooler on it – the 7600GS, with its miniature Zalman Flower, which would help the core to overclock stably. Given their small size, quiet running volumes and minimal heat output, any of these cards would be exceptionally well-suited to dual-purpose gaming and media centre rigs.

However, for overclocking purposes, it's still well worth investing in some extra VGA cooling, such as the excellent Zalman Noiseless VGA Cooler (see [www.zalman.co.kr](http://www.zalman.co.kr)), or even a watercooling setup (see page 42). It's surprising how much overclocking headroom extra cooling can actually create.



Zalman's VGA cooler is a great alternative to the noisy stock unit

## Technical specifications

	GALAXY 7600GS	MSI NX7600GT	POWER COLOR X1800GT	SAPPHIRE X1900GT	VERTO 7900GT
GPU/RAM	G73/ 256MB GDDR3	G73/ 256MB GDDR3	R520/ 256MB GDDR3	R580/ 256MB GDDR3	G73/ 256MB GDDR3
Speeds	500/1400	580/1400	500/1000	575/1200	450/800
Pipelines	12	12	12	12	24



Water cooling units are now commonly available from a host of retailers.

## Conclusion

The Sapphire leads the field in terms of price and performance

**B**ear in mind that, because of the monthly shifting of prices and the constant introduction of new versions of existing GPUs, the conclusions we come to today may not be quite as accurate in a few months' time. However, one thing never changes: we're all after the biggest bang for our bucks, and right now, the Sapphire X1900GT offers the best value for money in the mid-range.

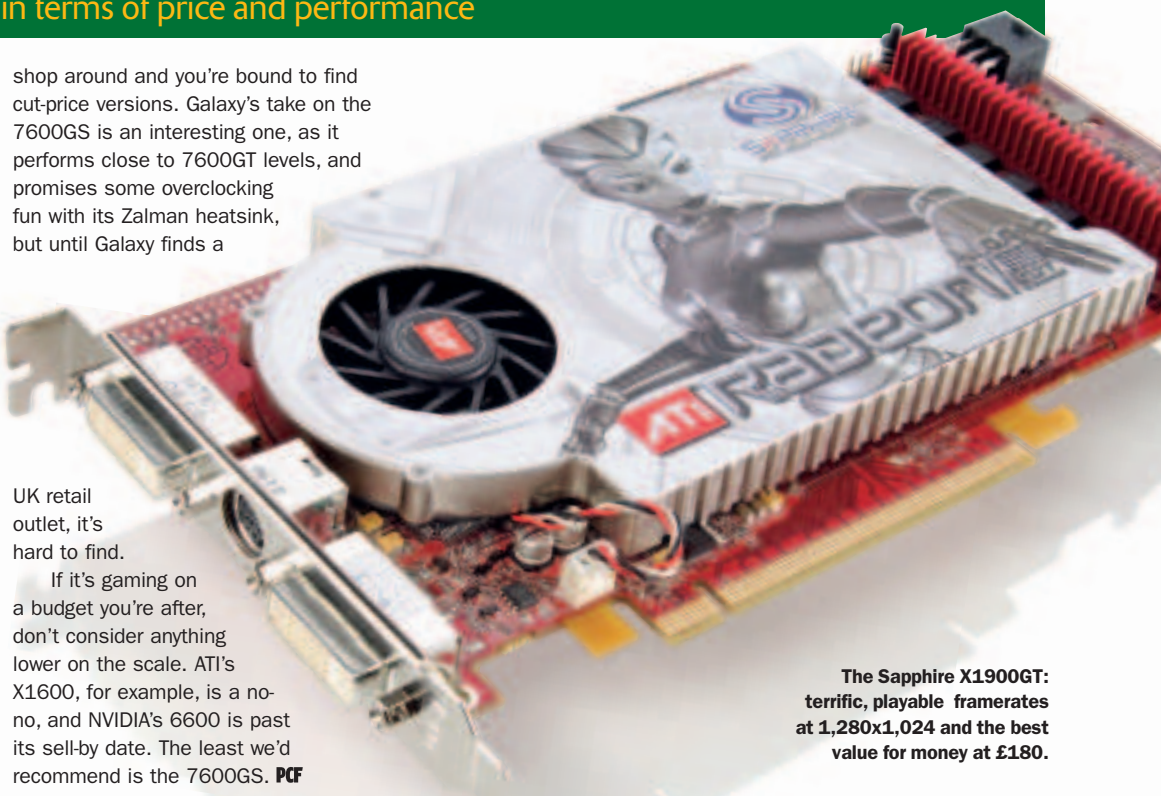
The bottom line is that it offers swish and playable framerates at 1,280x1,024, wrapped up with ATI's trademark superior visuals. It's £180 well spent, and we simply have to recommend it over NVIDIA's 7900GT which, while a good card, just doesn't make sense at its current price-point (around the £200 mark).

The cards at the lower end of the spectrum offer surprisingly good levels of performance, too. If you're really on a budget, you'd do well to consider the 7600GT, which gets the job done fairly smartly. As with any of these cards,

shop around and you're bound to find cut-price versions. Galaxy's take on the 7600GS is an interesting one, as it performs close to 7600GT levels, and promises some overclocking fun with its Zalman heatsink, but until Galaxy finds a

UK retail outlet, it's hard to find.

If it's gaming on a budget you're after, don't consider anything lower on the scale. ATI's X1600, for example, is a no-no, and NVIDIA's 6600 is past its sell-by date. The least we'd recommend is the 7600GS. **PCF**



The Sapphire X1900GT: terrific, playable framerates at 1,280x1,024 and the best value for money at £180.



## TALK IS CHEAP

# Philips 433 Duo

*Windows Live Messenger slips into the warm embrace of VoIP*

**Price** £129.99 **Manufacturer** Philips **Web** www.philips.co.uk

**M**icrosoft has a lot riding on *Live Messenger*. Originally, Messenger was the champion of web-based chatter. Now, thanks to the success of VoIP, Microsoft needs to get back to the top of the pile. Hence the Philips VoIP 433 Duo phones, the first of what's sure to be a slew of hardware tie-ins with *Live*. This pair of DECT phones offer dual functionality, connecting to a conventional telephone point for landline, and to a PC via USB for *Live Messenger* VoIP calls.

## CONTACT CALLING

On startup, the Duo 433 handset displays your *Live Messenger* contacts on its colour LCD screen. You need to sign up for Verizon's Web Calling service to make VoIP calls, but once you're in, calls to *Live* contacts are free. Though this is limited to *Live* users only, you can call any standard landline in Europe or the US for .012p per minute. Although this seems decent enough value, *SkypeOut* offers the same calls for 0.011p per minute.

The handsets have a sleek silver and black finish. Call quality is clear and reception strong, and

while it does take a little longer for a dial-tone to kick in for VoIP calling, the phones remain very easy to use. The handsets also have speaker-phone capabilities, caller ID, and an address book that can store up to 20 contacts in the handset and 100 in the base unit. Philips is to release a *Skype*-branded set in forthcoming months, which will be cheaper both to buy and cheaper to talk to your friends on, too.

Although these aren't the best value VoIP handsets available, they're definitely among the most stylish. It's just a shame they're Microsoft-only.

**Tom Dennis**

<b>Type</b>	2 x Digital DECT VoIP handsets
<b>Phone connection</b>	RJ11
<b>Broadband/PC connection</b>	RJ45, USB
<b>Talk time</b>	10 hours
<b>Standby time</b>	100 hours
<b>Message length</b>	160 characters
<b>DECT Range</b>	250m outdoor range
<b>Contacts book</b>	20 on each handset, 100 on the base station
<b>Requirements</b>	Windows Live Messenger account, PC with broadband connection via a router

**68%** **PCF says...** "Sleek and stylish, but let down by the silly price."

## EASY DOES IT

# FreeTalk VoIP Package

*Promises us hassle-free VoIP that's as easy as picking up the phone*

**Price** One year's subscription £80, then £7 per month **Manufacturer** FreeTalk **Web** www.freetalk.co.uk

**R**ecently, numerous non-PC-dependent devices have been launched to tempt the mass-market to internet telephony. But while a few of these, such as Draytel's VigorTalk, have enjoyed success so far, VoIP still remains the domain of the PC-literate.

FreeTalk hopes to change this with this compact VoIP box, which connects to your router via an Ethernet cable. It's compatible with any standard phone, too. In fact, barring the necessity to register a FreeTalk account online, you don't even need a PC.

stakes. While internet calls to any PC are free, popular destinations such as the US are 2p per minute, and India will set any prospective natters back a princely 11p a minute – marginally more expensive than *SkypeOut*, but far easier to negotiate.

What makes the FreeTalk a success is the realisation that firing up a PC just to make a phone call is a real pain. Here, VoIP calling is as it should be – easy to use, cheap and as straightforward as using a normal landline phone.

**Tom Dennis**

## PHONES FOR YOU

Once registered, you're granted a year of unlimited local and national calls. What's more, FreeTalk assigns you with a common landline number, which anyone can call you on at the standard UK rate. The twist here is that your home number and area code are assigned to the FreeTalk box, and not your PC, meaning you're contactable on the same number, and at the same rate, whether you're in Bognor or Bali.

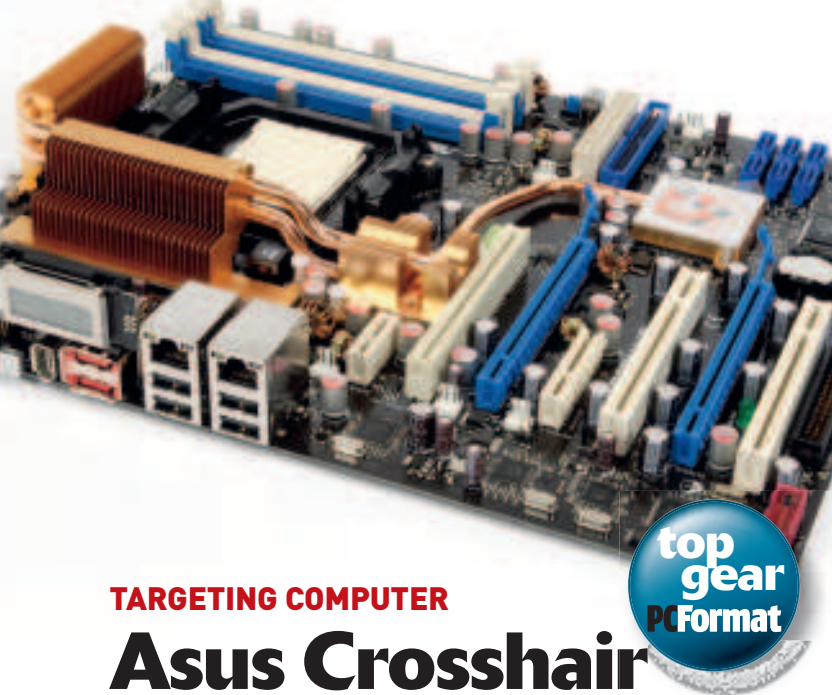
FreeTalk isn't technically free however, and loses out significantly to *Skype* in the value-for-money

<b>Type</b>	VoIP router
<b>Phone connection</b>	1xRJ11
<b>Broadband connection</b>	2xRJ45 10/00 base -T (1xWAN, 1LAN)
<b>Interface</b>	Signal strength lights
<b>Power</b>	AC100 240v
<b>Dimensions</b>	144x112x33mm (HxWxD)
<b>Requirements</b>	analogue touch-tone phone, broadband router connection
<b>Extras</b>	Network cable, voicemail, call waiting, answer phone service, unlimited UK calls

**82%** **PCF says...** "Cheap, easy to install and simple to use."







## TARGETING COMPUTER

# Asus Crosshair

This wilfully extravagant mobo is well worth getting in your sights

Price £180 Manufacturer Asus Web www.uk.asus.com

**C**larification time. It says Crosshair, not CrossFire. So ATI fanboys can relax, this isn't an nForce chipset that supports CrossFire. It is, however, one of the most ridiculously impressive motherboards we've ever seen at PCFormat, and that's saying something. By the by, it also glows a sinister blue.

First, the facts: this is an nForce 590 SLI motherboard that supports AMD's latest AM2 processors, boasts more features than the Cannes film festival, and will delight overclockers with a BIOS overburdened with options and settings. It also lights up like a cool Christmas tree when you power it up, apparently so that you can get your bearings when crawling around inside your machine – it's an impressive effort, but do you really need your machine doing *Close Encounters* impressions at 2AM?

## POSH PIXEL PUSHER

So how does it perform? 3DMark 06, which is bundled with the motherboard, managed an overall score of 6,084 using a ATI Radeon X1900XTX, which is stunning. Setting up the motherboard to use the automatic overclocking made little discernable difference (well, the score went up by 105 3DMarks). *Quake IV* fared little better, going from 107fps up to a massive... wait for it... 108fps. To be honest though, this was only after experimenting with the

default overclocking options, and there's a lot more scope for pushing your processor, memory and graphics card further.

Core 2 Duo may be putting the fear of the silicon gods in AMD, but AM2 still has the upper hand when it comes to memory throughput, and with a score of 7,142MB/s from the 1,066MHz memory used for testing, it's a sizeable lead at that. Turn on the overclocking options, and the memory throughput nudges up even more to 7,269MB/s – far from shabby.

There are some lovely touches on offer. For example, the jumper block that you plug your case's front-panel wires into before attaching to the actual motherboard is a real hassle-killer. The integrated power and reset buttons are also a joy, and despite our reservations about the lighting, it does all add up to a wonderful bit of kit. Only one problem really – it costs *how much*? **Alan Dexter**

Socket AM2

Logic NVIDIA NFORCE 590 SLI

Memory 4 x DDR2 800 (8GB max)

Graphics 2 x PCI Express x16

Slots 3 x PCI, 1x PCI Express x1

Storage 1 x UDMA 133, 6x SATA II RAID, 2x External SATA II

Networking Dual Gigabit Ethernet

Audio SupremeFX soundcard, ADI 1988b HDA

**85%** PCF says... "Heavenly for overclocking. Exclusivity at a price."

## THINKING INSIDE THE BOX

# FSP Booster X3

Take the load off your PSU with this supplementary power supply

Price £70 Manufacturer FPS Web www.fpsgroup.co.uk

**S**o, let's talk power consumption. At moments of peak draw, NVIDIA's 7900GTX uses around 85 Watts of power. The grunter ATI X1900XTX requires a rather heftier 120W, and the dual-VGA 7950GX2 needs a whopping 143W. Suffice it to say, graphics cards are drawing more power than ever before, and a high-end SLI or CrossFire setup will double those needs. If the rest of your system is already using, say, 350W, you're going to need an almighty PSU.

## BEAN COUNTER

That's where FSP's new puppy comes in. The Booster X3 is a supplementary PSU, designed specifically to power 3D cards. It slots into a 5.25" drive bay, with a power line-in that connects to your PC's back-plate, and from there to the mains. To power any graphics cards, it has two six-pin PCI-Express power-plugs, and a 300-Watt output.

The theory is that you could run anything up to a Quad-SLI setup without encountering significant problems. Which, using the 7950GX2, would draw around 286W, without even tapping your standard PSU on the shoulder. Oh, and pimps will appreciate the soft blue glow that emanates from the front-panel of the unit, which sits jut above or below your optical

drive, depending on where you decide to site it.

In essence, it's a sterling concept, and it would be useful in situations where you want to upgrade your graphics card, but your PSU doesn't have the necessary power for the task. Branded, pre-built PCs, where the PSU isn't pokey enough for anything but the out-of-the-box setup will benefit most from its grunt-injecting properties. However, the price makes it a problematic proposition. 70 clams is a tall order; that kind of money goes a long way in the PSU world. For example, £70 will net you an XCLio 600W silent SLI power supply, which will power your entire system, *plus* a pair of fat cards. If the Booster X3 were half the price, we'd recommend anyone with upgrade worries to go and buy one immediately; and no doubt, prices will drop as time goes on. But at the moment, it's just too expensive to recommend over a standard high-output PSU. **Alan Dexter**

Output 300W (2 x 150W PCI-E)

Cooling Dual front-intake fans

Fitting 5.25" Drive bay

Input 120V/240V standard

Dimensions 5.75x1.625x7.5-inch

**70%** PCF says... "Neat, but the same price as a complete PSU."





**BLOW OUT**

# Asus Lamborghini VX1

The latest supercar-endorsed laptop from Asus will no doubt pique Jeremy Clarkson's interest, but is it worth taking for a spin?

**Price** £1,899 **Manufacturer** Asus **Web** www.asus.com

**T**he word **Lamborghini** infers speed, power, good looks and kudos. So, we're duty bound to expect the same from this Lamborghini-branded Asus VX1 notebook. Sadly, this lappy suffers many of same unfortunate inadequacies as the brand itself: it favours brazen extravagance over practicality and design perfection.

The problem certainly isn't in the looks department. The VX1 is sturdy and attractive. The understated Lambo logo sits atop the lid which, like the main chassis, is slim and toned. The VX1's build quality is excellent too; it feels compact when you carry it, and the stiffness of the screen gives it a robust feel when the machine's in use.

Once you've started it up, the screen immediately disappoints. A wide-aspect design been shelved in favour of 4:3, and the viewing angle is pretty woeful. The 1,400x1,050 resolution goes some way to make up for this, but while the brightness levels are excellent, the contrast is poor. The screen isn't built for gaming, and even movie playback suffered from a little ghosting.

The VX1 is well connected, as WLAN 802.11 a/b/g is present, as well as

Bluetooth, two audio jacks and a 56K modem. The four USB ports are ample, but all positioned on the right – which clutters your desktop considerably. On the opposite side sits an adequate dual-layer DVD burner and a media card reader – albeit one that only reads SD, MMC and MemoryStick.

## SHINY ENTERTAINMENT

The power under the hood is where the Lamborghini excels, though. The pairing of a dual-core T2500 with 2GB of RAM made the VX1 fly through benchmarking, as did the 120GB hard disk.

Unfortunately, all this muscle is matched by a relatively meek GeForce 7400VX that really struggled in *3D Mark* and *Doom 3*. Factor in the panel, and you've a machine that struggles with gaming.

The VX1 is certainly a smart notebook, it suffers from its supercar branding. It delivers in terms of looks, build and power, but though the VX1 is

**"This is a machine that will struggle with gaming"**

competent, it doesn't represent good value for money – you can pay nearly £1,000 less for a similar-spec machine from a host of alternative manufacturers. Ultimately, Asus has reduced the prestigious Lamborghini branding to exactly that of a supercar: it's undoubtedly nice looking, but also outrageously expensive. **Tom Dennis**

<b>CPU</b>	Intel Centrino Duo 2GHz T2500
<b>Chipset</b>	Intel 945PM mobile chipset
<b>Graphics</b>	512MB NVIDIA GeForce 7400VX with Turbo cache
<b>Memory</b>	2,048MB DDR2 667 SDRAM
<b>Storage</b>	120GB, 54,000 RPM
<b>Screen</b>	15-inch 4:3 aspect ratio, 1,400x1,050 resolution
<b>Comms</b>	Bluetooth, WLAN 802.11 a/b/g, infrared
<b>Ports</b>	Express Card, VGA port/Mini D-sub 15-pin for external monitor, SPDIF, Line in, RJ11, RJ45 LAN, 4 x USB 2.0 ports, IEEE 1394 port
<b>Dimensions and weight</b>	331x272x30mm (WxDxH), 2.4Kg
<b>Battery life</b>	2 hours 12 minutes (8-cell 4800mAh)

BENCH MARKS	MOBILE MARK BATTERY TEST	PC MARK 2005	3D MARK 2006	DOOM 3
VX-1	2h12m	5241	327	42FPS
These benchmarks are run at the laptop's standard resolution of 1,400x1,050				

**55%** **PCF says...** "A sharp all-rounder ruined by a poor display, naff gaming and high price-tag."



# Send on the subs

Can dye-sub printers beat inkjets for postcard printing? **Matthew Richards** settles the score

**W**hen it comes to creating photos that you can hold in your hand, hang on the wall or put in an album, inkjet printers are a bit like the life of Forrest Gump: there may be no chocolates involved, but you never know what you're going to get. Image quality can be a moveable feast, and running costs for ink always seem to come as a nasty shock. Naturally, the more ink you put on a page, the more it will cost, so deeply saturated photos or those with heavy shadows can run up the bill out of all proportion. Dye-sub printing is a whole lot more straightforward.

Instead of ink cartridges, dye-sub printers use ribbons, which are normally purchased in packs, along with the paper. A pack of 50 photo pages with a matching ribbon cartridge, for example, will give you 50 prints – no more and no less, so you know exactly where you are. If the pack costs you, say, £15, each 10x15cm photo print will cost 30p, regardless of how much colour you use. By

buying twin packs or larger quantities offered by most manufacturers, you can expect to bring the page cost down to little more than 20p per print, making dye-sub much cheaper than inkjet photo printing. In some cases, the savings can be as much as 50%.

## HOW IT WORKS

Any inkjet printer, whether it's an HP thermal inkjet, an Epson piezo-electric system or a Canon Bubble Jet device, works by firing a fine mist of ink at the page. Dye-sublimation technology is completely different. The idea here is that the ribbon is the same width as the page to be printed and is split into four different sections for each print along its length. Each of the first three sections contains a different colour dye which, when added together, makes up the complete colour spectrum.

In most cases, the photo page passes through the printer a total of four times during the

printing process. While the first three passes are taking place, relative amounts of each of the three coloured dyes are fused from the ribbon onto the page, using a thermal process. This makes up the required colour and brightness level for each individual point on the page, so it's important that the paper transport system aligns the paper perfectly throughout each pass, in order to avoid registration errors. In the final pass, a protective coating is added to the photo print, which shields it against damage from exposure to moisture and light, adding to the longevity of the image. In practice, dye-sublimation prints are expected to guarantee anti-fade resistance for over a century, comfortably outperforming most inkjet offerings.

If you only require postcard-sized prints instead of full A4 photos, dye-sub printers should enable accurate, high quality results with sensible running costs. As always, though, some are better than others, so let's go in search of the best. **PCF**





## Samsung SPP-2040

**£65**

Manufacturer Samsung Web [www.samsung.com/uk](http://www.samsung.com/uk)

**87%**

## HOW WE TESTED

Getting the best results

Accuracy is everything in colour photography. We checked the output of each printer against a colour-calibrated monitor, looking closely for consistency in colour rendition and tonal range (brightness and contrast). As well as using a colour chart and a test image supplied by [www.photobox.co.uk](http://www.photobox.co.uk), we also selected a range of 'real life' photos, with subject matter ranging from vividly coloured Formula 1 racing cars, through high and low-contrast landscapes and beach scenes, to portraits

that included diverse skin tones. As well as colour and contrast accuracy, we checked the prints under a magnifier for sharpness. Dye-sub prints tend not to suffer from banding, but they can be susceptible to spurious light-coloured dots appearing on the page, due to dust and other matter getting into the transport system, so we kept an eye out for that as well. Finally, a more subjective test was used to gauge the level of gloss and evenness of the completed photos.

The SPP-2040 is a lot of printer for the money, which is undoubtedly why it cost around £125 when it first hit the market. With prices currently hovering at around £65, it looks a real bargain. It has a clear, large and bright two-inch colour LCD, as well as card readers that accommodate almost any media card. Couple this with PictBridge support and an optional Bluetooth pack, and it has great potential.

This versatility extends to an excellent menu system, which enables a wide range of picture adjustments. For example, the Colour Mode selector offers choices of normal, black and white, sepia, antique and vivid colour options, as well as colour correction filters and colour tints. There are facilities for tweaking sharpness and brightness settings.

In our tests, deeply saturated colours were vibrant, while output remained faithful for both light and dark skin tones. The 300dpi resolution is hardly class-leading, but prints were very sharp, and picture quality was also impressive. The SPP-2040 isn't quick, requiring about 75 seconds to output a 'first print'. However, batch printing six photos brought the average print time down to around one minute per 10x15cm photo. The only downside was that the Samsung seemed slightly more prone to specs of dust, giving it more than its fair share of distortion.

## TESTED!

The dye-sub printers churning out high-quality images this month

### Samsung SPP-2040 £65

The Samsung is something of a bargain. It's the cheapest printer here, has direct printing facilities, a two-inch preview screen and multi-format card reader.

### Sagem Photo Easy 110 £69

At £10 more than the Samsung, this Sagem printer looks a bit lacklustre, with no LCD or card reader. However, it does have IrDA support for camera phones built in.

### Canon Selphy CP710 £89

The CP710 is neat, tidy and quick off the mark. It's ideal for direct printing and Canon also offers a battery pack as an optional extra for mobile printing.

### Olympus P-11 £96

The sturdy P-11 has a professional feel and is easily the fastest printer in the group, with print speeds that are more than twice as quick as some other models. However, there's a real lack of direct printing facilities.

### HiTi S400 £147

HiTi printers have long been near the top of the dye-sub pile and the new S400 features smart styling, remote control and a host of picture optimising tools.



### Sagem Photo Easy 110

£69

Manufacturer Sagem Web [www.sagem.com](http://www.sagem.com)

65%



Sagem is well-known for its mobile phone range in this country, so it's no surprise that the new Sagem 110 comes complete with a built-in IrDA interface for direct printing from like-minded camera phones. To extend your connectivity options, there's also a choice of Bluetooth or WiFi dongles, although neither comes as standard and each of which cost about £25 on top of the normal purchase price.

As with most dye-sub printers, the Sagem's clamshell design makes for a small footprint but that basically triples once you fit the paper tray so you can use the printer. The menu system is very easy to use, mostly because the printer is so basic. There's no built-in card reader or LCD screen for previewing photos so, for direct printing, you're limited to PictBridge cameras and that IrDA connection for camera phones. There are a couple of added attractions for direct printing, including a Crystal Image setting which aims to fine-tune colour, contrast and sharpness, and there's also a red-eye reduction tool. However, these features would have been so much more appealing if the Sagem had been designed with more standalone functionality in mind. Given that the lower-priced Samsung is equipped with all mod cons, it's hard to recommend this.

Photo quality is good but not great. In our tests, brightly coloured images lacked a little vibrancy and skin tones were a bit on the lifeless side. Unfortunately, it looks like the Sagem is destined to be an also-ran of the genre.

### Canon Selphy CP710

£89

Manufacturer Canon Web [www.canon.co.uk](http://www.canon.co.uk)

80%

Despite its distinctly lightweight construction and diminutive size, the CP710 feels a really solid piece of kit and offers a good range of features at the price. Among these are a built-in card reader to complement the PictBridge and USB ports, as well as an intuitive menu system and colour LCD screen for making the most of direct printing, in theory at least. In practice, the 1.5-inch LCD is a bit on the small side and, in our tests, the card reader refused to 'see' any JPEG photos bounced onto media cards from a PC. Instead, it was only interested in photos placed into appropriate folder structures generated by digital cameras, which seems a bit unnecessarily limiting.

One cute touch is that Canon goes the extra mile in 'postcard' sized 10x15cm printing, going to the trouble of printing real postcard furniture like address lines, stamp outlines and so on, on the reverse of the photo pages. There's more too, in the shape of an optional paper tray (which you have to buy separately) that extends the printer's repertoire to wide format 10x20cm printing as well as the usual 10x15cm layout. Other optional extras include a rechargeable Li-Ion battery pack, so you can print your photos whenever and wherever you like.

Print quality is up to Canon's normally high standards but, to be critical, there was a tendency to add a very slight bluish cast to our test photos, which was acceptable in most cases but hardly flattering for skin tones.







## Olympus P-11

**£96**

Manufacturer Olympus Web [www.olympus.co.uk](http://www.olympus.co.uk)

**85%**

There's an argument that says if you want top photo quality, stick with a photography company. The Olympus P-11 adds a fair amount of weight to that oft-peddled point of view, as straight out of the box, it looks and feels more like a professional piece of kit than just another home photo printer. As well as the silver and black aesthetics and quality of finish, we particularly like the way that the paper tray sits fully inside the printer, so you don't end up doubling or tripling the unit's footprint each time you actually use it. The only thing you have to be wary of is picking up the printer by its sides, as the left hand side slides off completely to facilitate fitting the dye-sub ribbon.

One glaring oversight from the P-11 is the mystifying absence of a built-in card reader and associated LCD screen, so all printing has to be done via PictBridge or, preferably, from a PC. We can forgive it the media card oversight for two reasons. Firstly, the print speed is amazingly fast for a dye-sub printer, and even puts most inkjets in the shade, with 10x15cm prints being ready to frame in just 35 seconds. The second redeeming feature is the print quality, which is simply stunning.

In our tests, colour rendition from the P-11 was spot-on, time after time, for rich vivid colours and for skin tones alike. To be picky, some photos seemed very marginally high in contrast, but most users will much prefer that to a lack of vitality.

## HiTi S400

**£147**

Manufacturer HiTi Web [www.hi-ti.com/uk](http://www.hi-ti.com/uk)

**92%**

For years, HiTi has been setting the standard in dye-sub postcard photo printing but recently, other manufacturers have been catching up. The S400 aims to move the goalposts, with a new processor, image optimisation and improved ribbons and paper for better colour and brightness. Like the Olympus P-11, the S400 combines professional quality with eye-catching design, but goes a step further with wide ranging onboard controls for direct printing from memory cards and PictBridge cameras.

Standalone printing controls are supplied on a detachable control panel, along with a self-contained if slightly small 1.6-inch colour LCD. This attaches to the printer via a curly cable. The menu system is a little arcane, and sent us scurrying in the direction of the user guide, but it doesn't take long to get to terms with the interface. At this point, you're rewarded with a myriad of choices for colour settings and other image adjustment tools, as well as options to overprint dates, signatures and so on.

Print quality is super-sharp, making the most of the extra resolution that the S400 has over its competition, even if prints take a little longer to output. The overall level of gloss and evenness also seem a marked improvement over previous HiTi printers that we've looked at. Our only criticism, apart from the markedly higher price, is that, in standard print mode, all our test prints came out very slightly on the warm side for colour balance. On the other hand though, it delivers absolutely gorgeous skin tones.





## Dyeing in your arms

The 'image quality vs. features' debate in full

Based on the results of our tests, dye-sub printing has come a long way in the last couple of years, with current models offering superb performance. Even so, there are some significant differences between some of the models on test.

A couple of months ago, the Sagem Photo Easy 110 would have looked good value at £69, especially if you weren't fussed about its lack of media card reader and LCD. Recently, however, the price-plummeting antics of the Samsung SPP-2040 have blown the Sagem out of the water, not only undercutting its purchase price but also offering the lowest running costs in the group. Better still, you get a full complement of media card reader and PictBridge direct printing facilities, coupled with the biggest LCD panel in the group and great print quality to boot.

With the Samsung SPP-2040 being the cheapest printer in the group, and

being so good, why look further, or spend more? For example, the Canon CP710 had poorer colour accuracy and it has a smaller LCD. The CP710's only real plus point is its optional battery pack for printing on the move.

As you head up to the top of the price range, you do start to notice a rise in quality. The colour accuracy and all-

round image quality of the Olympus P-11 was slightly better than the Samsung, and its

cunning design rules out the need for paper trays that stick out. However, the improvement in image quality is fairly minor and the Olympus foregoes the versatility of a built-in card reader and LCD. For ultimate image quality and versatility, the HiTi S400 rules the roost but, unless you're a picture perfectionist, the buying price and running costs are a big step up from the small but perfectly formed Samsung.

**"The Samsung printer is small, yet perfectly formed"**

## Joining the dots

You don't need massively high resolution

Some inkjet photo printers have unfeasibly high resolutions, like the new Canon iP5200, which boasts a whopping 9,600dpi. Comparatively, dye-sub printers look like a bunch of poor relations with print resolutions typically of around 300dpi. However, it's important to realise that the difference between inkjet and dye-sub technology makes actual resolution of the final image almost irrelevant.

An inkjet printer fires tiny droplets of ink in a row as the print head traverses the page, before moving onto the next line. The end result is a series of very fine points of ink being placed on the page. By contrast, the thermal dye-sub process is able to lay continuous bands of dye onto the page, theoretically enabling smooth lines and finer graduations in colour. On a much larger scale, it's like the difference between drawing a line by making a series of individual dots along the edge of a ruler with a biro, compared with

holding the biro against the ruler and dragging it across the page.

The upshot is that, in real terms, a dye-sub printer with a quoted print resolution of 300dpi is roughly similar to an inkjet printer with an actual resolution of 4,800dpi. Upping the stakes still further, the HiTi S400 dye-sub printer on test, with its 403dpi resolution, is comparable to an inkjet printer featuring 6,400dpi. Even that's not a match for printers like the Canon iP5200 that we mentioned above but, subjectively, graduations in dye-sub prints can tend to be significantly smoother, making them a more popular choice with imaging professionals.

The downside to this is that dye-sublimation printing can turn out to be very expensive if you want to produce prints much larger than postcards. So, while a top quality A4 inkjet printer like the new Canon iP6220D only costs around £70, A4 dye-sub like the Olympus P440E cost upwards of £400.

## IN DETAIL Which printer is PCFormat's favourite?

**£65**

**Samsung SPP-2040**

**87%**



**£69**

**Sagem Photo Easy 110**

**65%**



**£89**

**Canon Selphy CP710**

**80%**



**£96**

**Olympus P-11**

**85%**



**£147**

**HiTi S400**

**92%**



RESOLUTION (INKJET EQUIVALENT)	300dpi (4,800dpi)	310dpi (4,960dpi)	300dpi (4,800dpi)	310dpi (4,960 dpi)	403dpi (6,400dpi)
MAX PRINT SIZE	10x15cm	10x15cm	10x20cm	10x15cm	10x18cm
10X15CM PRINT SPEED	75s	60s	58s	35s	75s
COST PER PRINT	21p	27p	22p	29p	34p
CARD READER	CF, SM, SD, MMC, MS, xD	None	CF, SD, MMC, MS	None	CF, SM, SD, MMC, MS
LCD SCREEN	2-inch	None	1.5-inch	None	1.6-inch
BATTERY PACK	None	None	Optional	None	None
PICTBRIDGE	Yes	Yes	Yes	Yes	Yes
BLUETOOTH	Optional	Optional	No	No	No
INFRARED (IRDA)	No	Yes	No	No	No
DIMENSIONS (WxDxH)	180x136x66mm	200x143x78mm	178x131x63mm	196x190x166mm	234x178x175mm
WEIGHT	1.1kg	1.4kg	1.0kg	2.3kg	2.5kg

# Pocket money pages

**SUB-£100  
GOODIES  
FOR THE  
BARGAIN  
HUNTER**



## Navicore Personal

Now you know the way to San Jose...

**Price** £100 **Manufacturer** Navicore **Web** www.navicoretech.com

**W**e're sure there are many of you out there who swore never to own a mobile phone. And satnav, like the mobile, is one of those things that seems unnecessary until you actually use it. The Navicore Personal brings the twin joys of satnav and smartphones together in a beautiful union.

The GPS software comes pre-installed on an SD card and works almost as soon as you slot it into any Symbian-based smartphone. The actual GPS receiver unit is about the size of a matchbox and connects to your mobile via Bluetooth.

The system works brilliantly. You don't even need the Bluetooth dongle switched on to plan journeys, so gruelling trips can be easily avoided. The display and voice commands are clear and prompt, and can be tailored for cyclists and pedestrians as well as motorists, so you need never get lost on your way home – or to Glasgow – ever again. Genius.

**gold**  
**PCFormat**

**90%** **PCF says...** "A simple, powerful GPS system in your pocket or on the road."

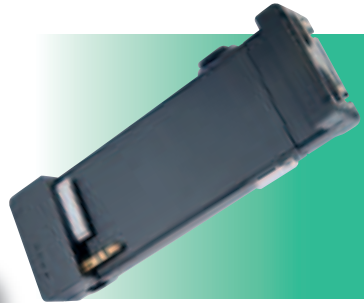


## Passport Pocket Drive

**Price** £75 **Manufacturer** Western Digital **Web** www.westerndigital.com

All you need for portable storage to work is something small, inexpensive and with enough space to fit your needs. To this ends the Passport Pocket ticks all the right boxes. With 6GB of storage available, you can carry around pretty much any data you might need to tote in your top pocket.

The swivelling head enables you to fit the device in all but the most awkward ports, even in our accursedly shaped Dell corporate boxes. It's also sturdy enough to survive the odd bounce, and comes complete with WD's synchronisation and encryption software for added protection.



## Rechargeable Battery Pack for iPod Nano

**Price** \$50 **Manufacturer** Zap! Portable Energy **Web** www.zapworld.com

Despite the iPod's popularity, battery life's always been a problem. Many rival MP3 players offer significantly longer listening times than your average pod, but if Apple styling is a prerequisite, you should consider a pack like this to keep the juice flowing.

The Nano fits snugly in the casing and doesn't make it too chunky for the pocket, but adds over 20 hours of playback over standard. It charges via the regular Nano lead and has a separate USB port to help power other gadgets too.



## Aurvana earphones

**Price** £70 **Manufacturer** Creative **Web** www.creative.com

Another month, another new set of noise-cancelling in-the-ear headphones. Creative's latest audio efforts are pretty classy, and come with a host of extras – a neat hard-case to tote them about in, three different sizes of earplug, a little bud-cleaning device to keep them wax-free, and a dual-plug adaptor for airline seats. They sound pretty nice too, with a good spread of sound from bass to high tones, and are comfortable from the off. We'd recommend them heartily were it not for the rather steep asking price of £70, but if you can find them cheaper, you should be in like Flynn.



## SHM-165P6S

**Price** £22 **Manufacturer** Lite-On Web **Web** www.liteonit.com

The early adopters and marketing men can get as wet as they like about Blu-ray and HD-DVD. For the majority of us however, these new high density, hi-def formats won't become a reality for a good couple of years, when they're both affordable and ubiquitous. In the meantime, there's no reason not to get an all-singing, all-dancing DVD writer. This model from Lite-On is a snip at £22, and offers DVD+R/RW/RAM/DL writing capabilities at high speeds. Surely this is one of the cheapest PC upgrades you can get? It's also available in black and beige, but sadly not silver, so most if not all PCs will benefit looks-wise.

**81%** **PCF says...** "Diminutive yet capacious solid state storage."

**79%** **PCF says...** "More power for your bijou music player."

**81%** **PCF says...** "Quality audiophile earbuds, but a wee bit steep."

**88%** **PCF says...** "An affordable, reliable DVD-writer. Buy one."





## Sansa e260

Nanotechnology from the competition. It's certainly pretty

Price £125 Manufacturer SanDisk Web [www.sandisk.com](http://www.sandisk.com)

**T**he Sansa e200 series MP3 players are obviously aimed at the prospective iPod Nano buyer, and to their credit, they actually have it beat in certain areas. The 4GB e260 stands up well to the challenge of the 4GB Nano, and comes in around £20-30 cheaper from most retailers.

Where it scores big points, though, is in the innovation surrounding the battery. It actually comes with novel devices called 'screws'. Simply by 'unscrewing' these so-called 'screws', you can take the battery out and replace it. No need for officially licensed technicians here. The sound quality is good, and the memory can be expanded via the Micro SD slot in the side. There's also a microphone, turning it into a high-quality dictaphone.

The only slight problem is the lack of FM-tuner in Europe and the incredibly cheap-feeling, plastic jog wheel. OK, so it lights up blue, but it still screams Christmas cracker. Aside from that, the build quality is excellent and has that reassuringly weighty, chock-full-of-technology feel to it.



## 8-in-1 Universal Remote

Price £19 Manufacturer Omega  
Web [www.aria.co.uk](http://www.aria.co.uk)

Thank heavens for universal standards. Every AV device, such as a set-top box, has its own three-digit IR remote code. Use a remote that utilises that code, and it's compatible with the machine. This remote from Omega contains, in its tiny silicon brain, a database of codes, which makes it compatible with nearly everything on the market. The handset lights up when you tap one of its touch-sensitive buttons, and it comes with batteries. However, it's rather plasticky, with a bulky battery compartment that feels wrong. The buttons could do with being a bit bigger, too. Oh well.

**67%** PCF says... "Useful, but rather inelegant and cumbersome."



## Team T-Shirt Kit

Price £17 Manufacturer Avery Price  
Web [www.averyinspired.co.uk](http://www.averyinspired.co.uk)

Aah, the old clipart library of yore. That's essentially what this pack from Avery contains, along with 10 sheets of t-shirt friendly paper. The premise is simple enough – design a t-shirt, print it out on the paper, then iron it onto a t-shirt. The library contains plenty of pre-designed motifs for birthdays, stag parties and so forth, but you can make your own using the rudimentary design package included in the pack. The clipart library is stuffed with more cheese than a gouda factory, granted, but if you're looking for a quick way of getting events-related shirts printed up, then this cheap-and-cheerful pack will cater for your shirt-printing needs perfectly well.

**69%** PCF says... "Uncomplicated. A good pressie for the kids."



## Walkman NW-E003

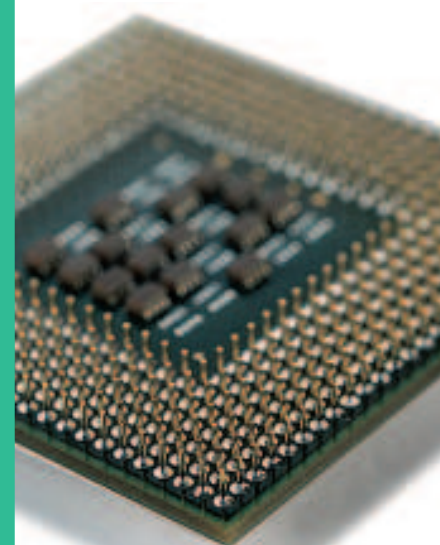
Price £80 Manufacturer Sony  
Web [www.sony.co.uk](http://www.sony.co.uk)

Say what you like about its pricing, but Sony really does have battery performance nailed. This 1GB USB-stick MP3 player requires two hours to fully charge, offering a whopping 28 hours playback, and takes a mere three minutes to charge it up to three hours' worth when it's flat. The crisp OLED display very pretty, and the sound is excellent. The downside is that, like all Walkman products, you need to use Sony's horrific SonicStage software to manage music. Come on Sony, sort your act out – drag and drop's the way forward with small players.

**73%** PCF says... "Nearly-ace player restricted by irksome software."

# Long term test

RATINGS BEYOND THE WARRANTY



## Intel Pentium 4 670

**M**y 3.8GHz P4 670 has been thrashed daily for over a year now, and I have to say, it's done me proud. Granted, at £375, there are much cheaper performance CPUs; the 2.6GHz Pentium D, for example, overclocks massively with mere stock cooling. But straight from the box, it's been a super gaming chip, and I recently started spinning the speed up to inch a bit more juice out of it. Nudging the FSB up from 800 to 850MHz has resulted in a healthy 4.1GHz CPU speed, and it's still totally stable. As everyone keeps telling me, it's high time I joined the dual-core revolution, and I must say the temptation is there, but I don't do a lot of video encoding – I basically surf and game with my rig, so for the present, a speedy single-core chip suits my needs just fine. With a gigabyte of DDR533 (overclocked to 667, natch) and an X1900XTX, I'm currently getting 5900 marks in 3DMark06, so I've no complaints. In all, it's been a totally reliable core, which has kept my games powering along nicely.

AI Bickham

We want your reviews... of still-hooded old kit: [al.bickham@futurenet.co.uk](mailto:al.bickham@futurenet.co.uk)

## ANIME MADE EASY

# Manga Clip Art

The budding PC artist's equivalent of the audio mash-up?

Price £12 Manufacturer Ilex Web [www.ilex-press.com](http://www.ilex-press.com)

**O**ur artistic aspirations are somewhat limited, so we became technology journalists. But every once in a while, something comes along that manages to blur the boundaries between genres. Is this an art book, or a software package? It comes presented in a hardback binding, with a CD-ROM thoughtfully mounted on the front.

But can you use one without the other? Well, not really, unless you want to swat flies. So, this is a software review, and not an art book review, but the presentation of *Manga Clip Art* definitely works in its favour.

On the CD-ROM you'll find a slew of files with .psd extensions and a trial version of Adobe's excellent *Photoshop Elements 4.0*. The book then offers guidance within that particular image editing package. The psd files include various examples of 'line art' (that is, black and white outlines) in the Manga style.

## COLOURING IN

There are people, locations and accessories to choose from, and the book leads you through the editing process. Being familiar with *Photoshop* tools and terminology will help, however, as the guidance often seems rather hurried. Once you've selected your image, saved it to your PC, edited the line art

and set the colour mode, you can go about decorating your construct. This is the fun part, because it's the bit that requires the least patience. All too often, we found ourselves loading up any old image and realising after five minutes we were trying to create a pink volcano or a green skyline.

If you've dabbled in image-editing before, you'll love this, whether you're a fan of Manga or not. The best idea is to work through the book as it guides you into the more complex aspects. But we'll defy anyone not to want to jump straight into adding detail to that lovely big robot. Though he does seem to lose some of his machismo when standing on a pink volcano. **Andrew Sutcliffe**

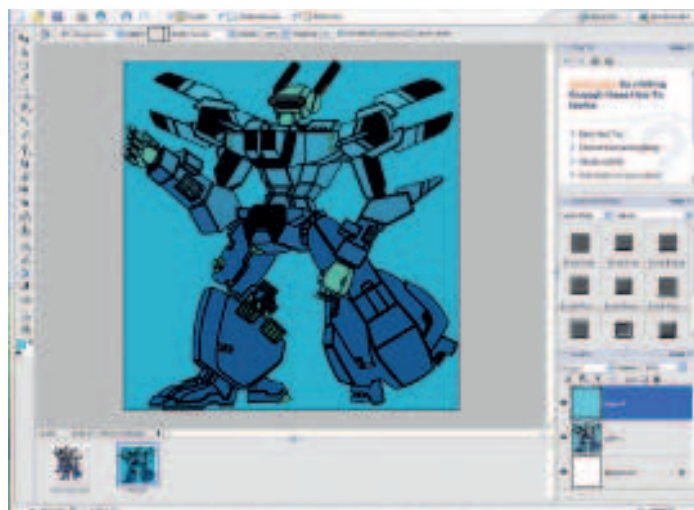


**Big eyes, mad hair, child-like face. Yep, that's Manga alright.**

**Needs** 1GHz CPU, 512MB RAM, 64MB 3D card

**Wants** 2GHz CPU, 1GB RAM, 128MB 3D card

**79%** PCF says... "Fun and hard to hate, especially considering the price."



There are images to please every whim – even robot fancier Alec is catered for.



Yes, that's a lot of problems. Please don't ask how we got 'em.

## BUM NOTE

# TuneUp Utilities

The sound of crushing disappointment harmonising with borked registry entries

Price £22 Manufacturer TuneUp Software Web [www.tune-up.com](http://www.tune-up.com)

**H**ands up those of you who carry out regular maintenance chores and keep your PC running in tip-top shape? If you're anything like us, you'll be too busy actually using your PC to perform many of the essential tasks which maintain a healthy, happy Windows XP environment, just as it's supposed to be. Stop laughing at the back.

*TuneUp Utilities 2006* aims to provide you with the tools to make sure your system remains fully optimised or, if you prefer, gives you the option to make it look as pretty as possible. So let's talk about making it more powerful. The utilities package encompasses seventeen different programs, all dedicated to a particular area of your system, whether that be optimisation, customisation or maintenance. This includes registry cleaning, start-up management and uninstall tools.

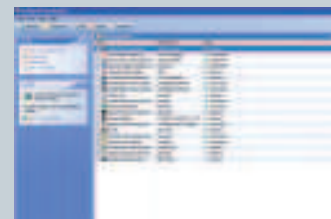
This is all pretty standard fare, matching Iolo's superior *System Mechanic 6*. *TuneUp* does boast optimisation for *Firefox*, but to be honest, we saw only a slight increase in our surfing speed. And that's this all over – you may, or may not, notice improvements.

Of course, it's nice to have all of these customisation options available in one place, but aside from much better presentation, it doesn't really offer a lot more than *TweakUI*. *TuneUp*'s ace is having

everything in one neatly presented place. And that isn't really enough for us. Sure, if we'd seen stellar performance increases then we'd get excited, but there isn't much on offer here that can't be offered by collecting a few freeware utilities off the web – *WinPatrol*, *Ccleaner* and *Cacheman* spring swiftly to mind.

## OUT OF TUNE

It's reasonably priced so if you don't already know or care to know how to look after an ageing PC, this could be exactly what you need. If, however, you already use most of the free utilities above (or one of the legion of alternatives) then this isn't worth the extra wallet-pain. **Andrew Sutcliffe**



Disabling non-essential programs will improve start-up times. Slightly.

**Needs** 133MHz CPU, 32MB RAM, 64MB 3D card

**Wants** 1GHz CPU, 512MB RAM, 128MB 3D card

**65%** PCF says... "Comprehensive, but certainly not essential."



**RUBBISH**

# Media Centre for Xbox 360

It doesn't actually explode. This is where the first 1% of the score comes from

Price £30 Publisher Fire International Web [www.xploder.net](http://www.xploder.net)



Watching movies through this pointless add-on is a trial.

**G**ot a media centre PC? Got an Xbox 360? Got a collection of legit video files that you can't stream between the two because the *Media Center* shell on the 360 is limited in the file formats it supports? OK then. You should go to [runtime360.com/projects](http://runtime360.com/projects) and grab *Runtime 360*.

You'll see how it adds an icon in your system tray and an option to the context menu in the *Media Center* interface, so you can play back the file. It's fiddly, you have to do it one file at a time, and the seeking isn't very precise, but it makes your 360 10 times more useful and hey, it's free.

Alternatively, if you're, oh, suffering from a severe head injury, you could try Xploder's *Media Centre*. It works in the same way, except it eats all your system resources, dumps a playback

window on your PC when in use, doesn't let you seek at *all* unless you trek back to the PC and use said window, and costs £30.

## SEEING STARS

While being beaten by a free download is impressive, it goes further by actually *being* a free download – a variant of *VideoLAN*. Any positive karma offered by the use of open source is dispelled by the inclusion of the worst music management app ever created.

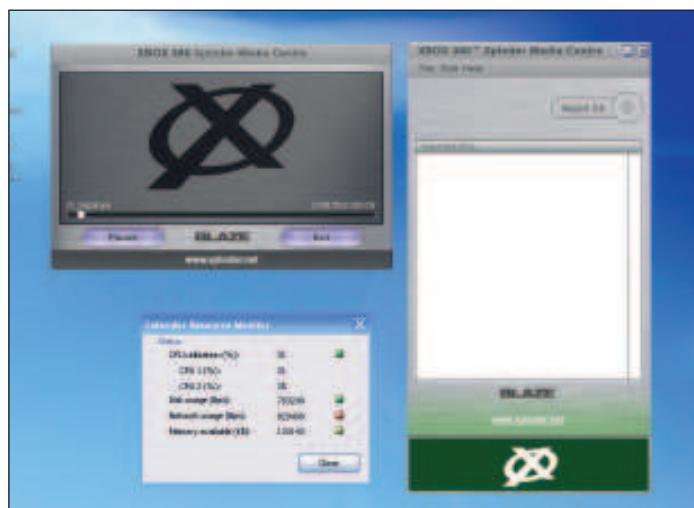
Not content with the pointlessness of being a music copying program for use on OS designed to support music copying, it demands registration, and while it claims to support album art, you have to get it yourself – and suggests going to Google Images.

The single advantage is that it includes a crossover cable, but it manages to spoil that by making it green and three feet long, and hence only useful if you're colourblind and myopic. **Jon Hicks**

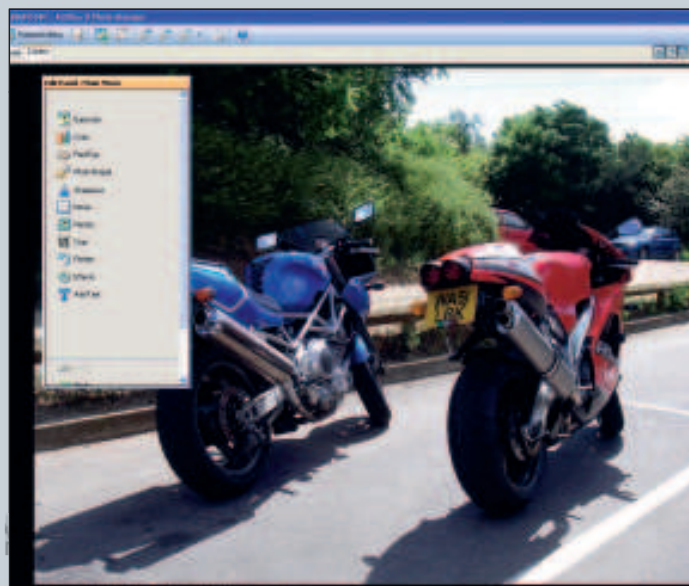
**Needs** Media Center PC, Xbox 360

**Wants** For everything

**05%** PCF says... "Ugly, buggy, and worthless in every practical respect."



Xploder: putting the "argh, k1ll me now" into *Media Center*.



If casual photo tinkering is all you're after, and you don't want to get bogged down in a bigger, more complex app, check out *ACDSee 8.0*.

## IMAGE CONSCIOUS

# ACDSee 8.0

Bargain photo manipulation software that's a doddle to use. What's not to like?

Price £30 Publisher ACD Systems Web [www.acdsystems.com](http://www.acdsystems.com)

**W**ith the rise and rise of Google, there's a good argument for never needing to buy software, ever again. Google Pack gives you *Norton Antivirus* software, *Firefox* for hassle-free web-browsing, *AdAware* for keeping your PC grint-free... and *Picasa*, to handle all your basic digital photo-manipulation needs.

*Picasa's* also a great application, and really is all you need to tart up scrappy digital snaps. With automatic red-eye, colour and contrast fixers, it's the amateur photo fudger's delight. Some of us, however, like a bit more depth to our digital art packages, and you'll no doubt be pleased to read that *ACDSee 8.0* can cater to these needs, too.

## ROCK SOLID

Granted, it's got nothing on the smooth and intuitive *Microsoft Digital Image 2006* interface, or the ease of use and sheer image-processing power of the industry standard package, *Adobe Photoshop Elements*, but it offers a deeper level of control than comparable free applications.

While the interface is undeniably a little on the clunky

side, it's packed with tweaky manipulation options, such as cropping, noise reduction, effect overlays and so on.

*ACDSee 8.0's* real strength is in the level of organisation it offers however. While it doesn't present images as intuitively as *Picasa*, it does allow you to edit your images' IPTC tags, so you can attach a whole mien of information to shots. In addition, the Quick Search function is a dream to use – it's quick and clever, and doesn't miss a trick.

Ultimately however, you have to examine your needs very closely. If all you require is a simple manipulation program to clean up photos, then get *Picasa* – it's free, after all. If you don't want to spend a lot, then *ACDSee* is a good choice. But if you want total control and more options than you'll ever need, spend a bit more and go for *MS Digital Image* or *Photoshop Elements*. *ACDSee* is very much a mid-range offering. **Al Bickham**

**Needs** 500MHz CPU, 128MB RAM

**Wants** 2GHz CPU, 512MB RAM

**69%** PCF says... "Better than free software, but lacks killer features."



## SPECTRAL NONSENSE

# Prey

So relentless you'll want to lie down, or possibly fall sideways

Price £35 Publisher 2K Developer 3D Realms Web [www.prey.com](http://www.prey.com)

**O**n the whole, the PC hasn't exactly been swamped with new FPS experiences lately. Your choices have been either package tours of the D-Day landings or bite-size chunks of ravaged cityscapes, with maybe a dash of cel-shading if you're being overwhelmed by Gallic verve. Kudos, then, to *Prey*: it doesn't exactly take the mould out and stamp on it, but there's plenty to suggest the developers were drinking heavily in bright sunlight and possibly eating violently coloured berries for nourishment: the result, while not revolutionary, is definitely Something We Want To See More Of.

The setting – we'd hesitate to use the word “plot” – is the first jewel. “Native American gets picked up in alien

## ON THE DVD

>> Screenshot gallery

## BUY THIS IF YOU LIKE...

>> *Half-Life 2*  
Valve  
>> *FEAR*  
Vivendi  
>> *Doom 3*  
Activision

harvest of humanity and uses previously unsuspected spirit powers of the Cherokee to fight through vast orbiting Death Star thing” is so far-fetched, even Steven Segal wouldn't sully his hands with it, and in the opening stages at least, it's played very well. The opening setpiece is excellent, an authentic alien abduction that starts with a bar fight and ends as you're all sucked out into space to the strains of *Don't Fear The Reaper*, and once in the unpleasantly slimy confines of the alien ship, you discover that you've got a sort of spirit form you can use to get around, guided by the ethereal presence of a dead bird.

## GOING LOCO


While your mind is still reeling from the seamlessness of that *Pocahontas*/*Star Trek* crossover, you have to get used to remarkably flexible gravity – not the weedy, localised stuff that pantywaist Gordon Freeman totes around, but the real which-way-is-down deal. Wandering around is a genuinely eye-popping experience, with the world regularly rotating in 90-degree bursts, numerous fights taking place with enemies scattered across the ceiling, and never daring to jump for fear you might fall upwards to your death.

Finally, just to fry the last few brain cells that are still clinging to rationality, the place is stuffed with portals and temporal anomalies. Every time you hop through one it's anybody's guess where “down” will be – and at one point you'll find yourself chasing a weirdly cowardly

**“Prey offers not only a genuinely new experience, but also a surprisingly cerebral one”**

enemy for several minutes, until it becomes apparent that you're looking at the back of your own head.

It's a brilliantly barking combination, with the ludicrousness of the setting exaggerating the brain-mangling world rules. It's not only a genuinely new experience but a surprisingly cerebral one, too. The first half is a great mix of regular gung-ho action dotted around puzzles that show off the ghost-form and gravity tricks, which are interesting while never being too challenging. It's akin to the original *Half-Life*, albeit spoiled by the observations of your suffocatingly dim protagonist.

Unfortunately the new ideas dry up a bit too quickly, and there's a steadily increasing reliance on FPS cliché. The biggest grind is the set design, which is a *Doom 3* job-lot of engine and environment: dark, red-lit corridors bedecked with organic squishiness and unpleasantly gynaecological decorations. 

## Come fry with me

High-speed travel, the *Prey* way...



While you're on foot for most of the game, there's the occasional trip out using shuttle craft: calling them vehicles is disingenuous as they just tack a bit onto your HUD and reduce gravity, but they do help you into some more puzzles: trekking across small planets in such a way as to get off them, rather than plummet to your doom.





Death? Pah! You're a Native American with a spirit guide – just kill a few moments in limbo before reincarnation.



## Baddies by the numbers

Don't stop us if you've seen these predictable foes before



**1** Well known for attacking innocent Native Americans as they steal alien flying devices, these red-eyed fiends are also wanted for questioning in the ongoing investigation into precisely why the last two *Matrix* movies were soul-suckingly awful.



**2** She might look innocent, but this comely young maiden finished off an entire squad of inaccurately named crack troops. Now she's joined a gang of a dozen spectral kiddies, armed with sinister nursery rhymes and rooms with really bad lighting.



**3** Wanted for his alleged involvement in three games and a rubbish movie, Mr Cake O'Demon has now adopted a cunning disguise of sticking someone's torso on his back. He is considered dangerous and should not be approached. Duh.

## "The setting – we hesitate to use the term 'plot' – is so far-fetched, even Steven Segal wouldn't touch it"

It's initially creepy, but the effect doesn't last: there's the bare minimum of interactivity bar blasting the occasional wobbling tentacle in otherwise static, uniform passageways.

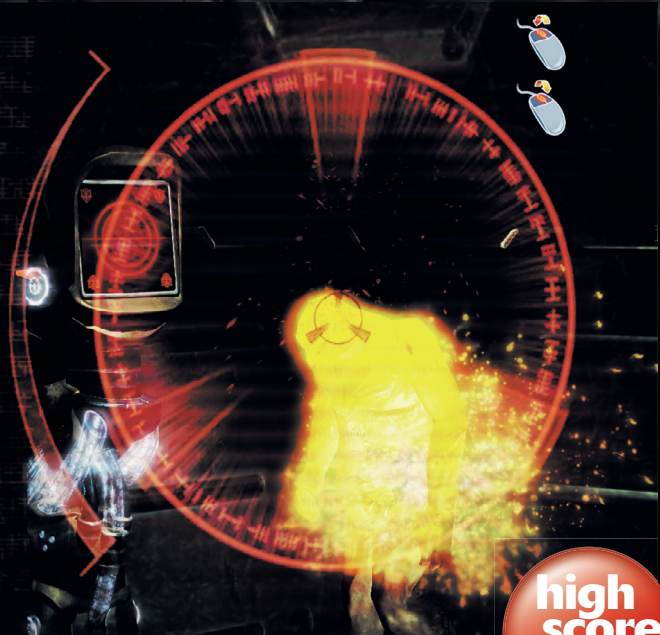
The feeling that you've shot it all before is increased manifold by the enemies, which are a grab-bag of contemporary dread: ghostly little girls, mutants who end in robot spider legs below the waist, and three storey-high demons with rocket launchers for hands. The stuff of nightmares, sure, but nightmares of six years ago, and the promising almost-scares in the opening levels are gradually replaced by that genre favourite: things that fire at you while strafing a bit.

### FIREARM FUN

And oh, the weapons. They might look like gristly, mecha-organic abortions that flopped out of the *Alien* props bin, but they're functionally identical to every other FPS weapon you've ever used – the basic rifle even sounds like it's bolt-action despite looking like a career-ending rugby injury. At least you're spared the most obvious rip-off of a gravity gun, probably due to the clunky and largely ignorable physics.

It's to *Prey*'s credit that such a clunky approach stays enjoyable for so long, with the initial spark of gravity tricks supported by the genius innovation that you never actually die. Instead, whenever the health bar hits zero, you're dumped into a spiritual halfway house, where you get a few

"I told you – if you'd dressed more sensibly in the first place, this would never have happened."



Alien technology has hitherto been unable to improve on the sniper rifle, bar the addition of exciting noises.

high  
score  
PCFormat



While the first half is surprisingly gore-free, later stages offer almost uninterrupted violence. Fetch the mop, somebody.

minutes to shoot down some spirits and boost your stats before you're dragged back into the action. Thus you avoid any repetition, and progress is always swift: while it doesn't quite have *Half-Life 2*'s ability to con you into thinking you're actually exploring, it's not far off.

Alas, the earlier innovation tails off towards the end, and the closing quarter of the game just throws more and bigger enemies at you rather than adding anything new. The closing stages are a grim, gore-filled slog against chorus lines of rocket-spewing attackers, and it's only the pacing and the hope of another sub-*Ed Wood* plot twist that keeps you going.

It's a shame that such promising beginnings end up as just another FPS, but even at its most pedestrian, it's never dull enough to stop playing – and it's still a sight more interesting than being handed another BAR and pointed at Omaha Beach. *Prey* is undoubtedly a big dumb shooter, but it's a big dumb shooter with some bright ideas and the best kind of Hollywood excess behind it, and that's a lot more fun than nearly all of the competition.

Jon Hicks

**Needs** 2GHz CPU, 512MB RAM, 64MB DX9 card

**Wants** 2.5GHz CPU, 1GB RAM, 128MB 3D card

**Net gaming** Deathmatch

**Discuss** [pcformat.co.uk/mag/prey](http://pcformat.co.uk/mag/prey)

**84%** **PCF says...** "Flawed but undoubtedly fun. An endearing, spectacular shooter."





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Erk. Which way is down?

"Pay attention, 007: this is  
the thing that you'll be firing  
space-grenades at."



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"Yarr, that lad'll have us plunging o'er the edge o' the world next..."

## SWASHED BUCKLES

# Age of Pirates Caribbean Tales

This ain't no Saga cruise around the tropics

**Price** £30 **Publisher** Playlogic **Developer** Akella **Web** [www.ageofpiratesthegame.com](http://www.ageofpiratesthegame.com)

**Objectivity is a bitch.** PCFormat tries to remain neutral in all things, but hot diggity dang, pirates are cool. We've been waiting for this one a long time. It's hard, you know, maintaining that journalistic air of sneering cynicism when you're giggling like a schoolgirl every time a volley of cannon-fire rips through the hull of your latest conquest.

*Caribbean Tales* a divisive game. In short, it's *Elite* with tall ships, wenches and grog. Initially, it's frustrating, but delve deeper and the fun really starts. There's a lack of superficial gloss, too.

## Ship shape

All right, John? Got a new cannon?



The tense sea battles provide the most fun in *Age of Pirates*. Slipping into first-person mode on deck to watch your enemy through the telescope, then lining up the ship in third-person to provide a devastating volley of shots, is engaging, tactical and thoroughly satisfying on every level.

### ON THE DVD

>> Screenshot gallery

### BUY THIS IF YOU LIKE...

>> *Sid Meier's Pirates!*  
2K Games  
>> *Virtual Skipper 4*  
FHI  
>> *Silent Hunter III*  
Ubisoft

Some of the voice characterisation is, frankly, embarrassing (conversing with the bored-sounding 'locals' is tedium central) and navigating the pathways surrounding the island ports seems to be needlessly restrictive.

### SALTY SHENANIGANS

As either Blaze or Beatrice Shark, you begin your adventures with a tub of a ship and a limited crew. Just don't spend too much time in the third-person boots of your character... Combat and movement is so horribly stilted, you'll soon long for the ocean waves and calming sounds of cannon-fire.

The point of it all, though, isn't in this land-lubbing; it's about taking to the high seas and making your way around the world. You can play however you like – stay the right side of the law and trade 'til you're rich; build a fleet of trading vessels and buy your way to the top; or do it the pirate way, where you'll find out how brutal things can really get...

Most players will feel happiest occupying the grey area in-between, especially once you get deeper into the quest, which has you inheriting half a treasure map. Still, you can ignore this storyline if you want, instead trading,



Each ship needs a captain – someone whose abilities you've tailored well.



Fight your way past the mêlée to engage the opposing captain one on one.



Exploit the protective umbrella offered by an island's own cannons when you can.

maiming and governing whole islands if that's more your barrel of salt.

A wealth of options are available once you immerse yourself in *Age*, so much so that it's easy to forgive the game's minor faults. After all, the generic port-towns essentially serve as a glorified menu system for navigating your way between shipyard and tavern. Developer Akella must surely have recognised this – why else would it have introduced a quick-travel option that enables you to tailor play and edit out much of what grinds?

Ignore the game's little flaws. Once you've got yourself a fleet of ships, captained by characters you've trained up yourself, and you're sailing around the beautiful Caribbean seas under a glorious sunset, you'll easily see why we warmed to this one.

**Dave James**

**Needs** 1.8GHz CPU, 256MB RAM, 128MB 3D card

**Wants** 2.5GHz CPU, 1GB RAM, DX9c 3D card

**Net gaming** LAN or internet; up to 16 players

**Discuss** [pcformat.co.uk/mag/ageofpirates](http://pcformat.co.uk/mag/ageofpirates)

**80%** PCF says... "Tense, drawn-out battles aho! Combat at sea has never been such fun."



## UGLY VIOLENCE

# Cossacks 2 Battle for Europe

Return from the wrong side of the Urals to marshal some sword-waving berserkers...

Price £20 Publisher CDV Web [www.cossacks2.com](http://www.cossacks2.com)



The graphics are decidedly patchy throughout, but at least it plays adequately.

**O**riginality seems to be in increasingly short supply these days, so sequels, add-ons and remakes are taking over the gaming landscape. Like the one-eyed man who would be King, the standalone sequel fairs reasonably well next to its blind cousins, the add-on packs. Such is the case with *Battle for Europe*, the follow-up to *Napoleonic Wars*.

As an RTS, *BFE* is reasonably solid, but it's somewhat spoiled by certain key areas of the game falling well short of our high expectations. Whilst not terrible by any stretch of the imagination, the graphics are pretty mediocre throughout. Admittedly, they throw up the occasional attractive building, but the landscapes are largely devoid of inspiration.

The in-game sound is another big let-down, because we include the voice-acting in that. The music sounds as though it was recorded with a very limited set of MIDI instruments and becomes very annoying in a short time – the

tunes aren't terrible but the voicings of the instruments really got on our wick.

### LISTEN UP, MEN

The voice acting is also noticeably below par. Acknowledgements of your commands as you order buildings to be built or move your troops around would be more convincing if the accents were better. It's not a good idea to call a game *Battle for Europe* if some of the British accents have an American twang.

Strategies in battles are well thought out and frequently challenging, and the historical accuracy is almost, if not completely, correct. Cannons don't work well near swampland or open water, and hiding behind a tree is great way to avoid death by musket. You get three playing options – Campaign, Battle for Europe and a quick skirmish mode, but only confirmed fans of previous iterations of the sterling *Cossacks* franchise are likely to stick with all of those.

**Andrew Sutcliffe**



Attacking fortifications is unwise.

**Needs** 1.5GHz CPU, 512MB RAM, 64MB 3D card

**Wants** 2.4GHz CPU, 768MB RAM, 128MB 3D card

**Net gaming** None

**69%** PCF says... "If you can stand the aesthetics, fun lurks within."

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The new Great Wall wonder encircles your land and is visible from the world map.



You have PCF's permission to protect those bananas by any means necessary.



Don't send a boy to do a man's job – send a man on an elephant. That'll get results.



Unit production can be sped up, but it's not crops we're interested in: we prefer war.

## INVASION REDUX

# Civilization IV Warlords

Its first add-on expands the *Civ IV* universe in every direction, but is there a cheaper way to build an empire?

Price £25 Publisher 2K Games Developer Firaxis Web [www.civiv.com](http://www.civiv.com)

**T**he time has come: reopen the forbidden drawer. Gently pushing aside our prized 1998 *Pirelli* calendar, we glimpse our quarry – *Civ IV*. We meet again, old friend.

Actually, our turn-based paramour hasn't been locked away for long. Rebooting *Civ IV* to play this expansion pack feels exactly like hooking up with a best buddy.

*Warlords* is just as compelling as the original game, built on a 'just one more turn' principle that will ruin your real life even as it enhances your virtual

### ON THE DVD

>> Screenshot gallery

### BUY THIS IF YOU LIKE...

- >> **Civilization IV**  
2K Games
- >> **Rome: Total War**  
Activision
- >> **Rise & Fall**  
**Civilizations at War**  
Midway

existence, with an epic narrative of war, diplomacy and technology. And there's plenty of new stuff to keep you entertained here, too.

### FANCY A RACE?

For starters, there are eight new scenarios. Each of them pares *Civ IV* down into slices of history, forcing you to ignore the impetus to research new techs. Here you have to work with the resources at your disposal to unite the Chinese empire, lay waste to Alexander's rivals or battle for control of the Med.

New races are debuted in some of the campaigns – with Hannibal's Carthaginians leading a baying band of warmongers from the Viking, Celt, Ottoman, Zulu and Korean empires.

New leaders have been included too, with a wobbly-faced Churchill swelling the ranks (literally) alongside Ramases II, Augustus and Stalin. And there's a smattering of new units, buildings and a trio of new wonders. Such additions, though, are largely superficial, as Firaxis stretches new skins over the skeleton of familiar gameplay.

There are two stunning victories in *Warlords*, however – the new Great

General unit and the vassal state dynamic, which enables you to lord over a nation that capitulates in conflict. Your new proles will vote with you on resolutions and follow you into battle if you declare war. Pity you can't make unreasonable demands of them to supply troops and resources like the British used to, though.

The great shame of *Warlords*, however, is that new leaders, units, maps and mods are all online from sites such as [civfanatics.com](http://civfanatics.com).

In webland, this constant stream of homebrew add-ons vies with *Warlords* for your attention. And though fan-created content isn't always as far-reaching as the official output, it has one major advantage – it won't cost you a penny, let alone £25.

**Lee Hall**

## Generally speaking

Men of action, invariably wearing big hats



The addition of Great Generals is a tasty one. These titans of strategic thinking are all harder than Russian algebra, and can be deployed to beef-up flailing units, create an academy to speed up unit production, or to train new troops for you. But why on Earth weren't they in *Civ IV*?

**Needs** 1.2GHz CPU, 256MB RAM, 64MB 3D card

**Wants** 2GHz CPU, 1GB RAM, 128MB 3D card

**Net gaming** 2-8 players, online or via email

**Discuss** [pcformat.co.uk/mag/civivwarlords](http://pcformat.co.uk/mag/civivwarlords)

**77%** PCF says... "A luxury item, unless you've already gorged yourself on *Civ*'s online mods."





Jack is at least engagingly unsteady on his feet throughout the game.

## SHORT PLANK

# Pirates of the Caribbean The Legend of Jack Sparrow

Be Johnny Depp! Be Orlando Bloom! Be bemused by a sub-standard cash-in!

Price £30 Publisher Ubisoft Web [www.ubi.com](http://www.ubi.com)

**R**ecently, Editor Adam invented a new verb: to 'disenjoy'. To disenjoy something is to at first enjoy it, and then have that enjoyment removed by a related experience. So, Adam enjoyed the first two *Alien* films, but was so wholly disheartened by *Alien 3* that he can no longer bear the first two. They have hence been 'disenjoyed.'

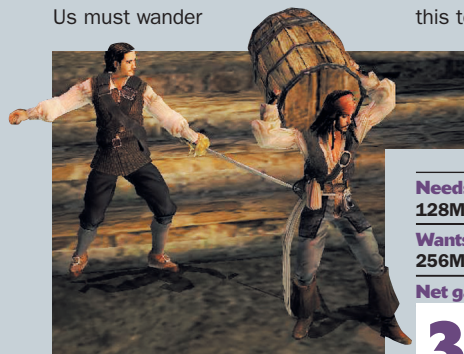
And so to *Pirates of the Caribbean*, a game which gleefully ticks *all* of the boxes on PCF's Things To Look Out For In Dodgy Film Tie-Ins wallchart. The gameplay (wander through passable-looking landscape, press buttons in sequence when instructed, await brain atrophy) has been ripped from the Xbox version. In fact, this is the Xbox version – let's not pussyfoot.

The game begins with some cursory mention of some lost dubloons, or somesuch hokum, and then Jack and Orlando's Character Whose Name Escapes Us must wander

around an Xbox game fighting off generic pirate drones, doing logic puzzles a parakeet could suss out, and pressing buttons that have large arrows floating over them. *Splinter Cell* this ain't.

## PARROT FASHION

The best thing we can say about this is that it plays like an above average Xbox game, and there's some tension to be had if you persevere. What there aren't though, are rewards: collecting coins (!) allows you to give Jack and The Other One extra combat moves, faster healing and so on, and using some of these produce pleasing PS2-style graphical effects. There are some by-the-numbers bosses, but they're also rubbish. So, unless you are obsessed with all things Sparrow, there's no need to dirty your hands with this. Remember: your PC will soon be home to *Crysis*, and it probably cost you a lot of money. Is this what you bought it for? Play this to the end, and you could end up disenjoying the *Pirates* films, or even all games, so be careful. **Alex Jones**



Hardly a barrel of laughs though, eh?

**Needs** 1.5GHz CPU, 512MB RAM, 128MB 3D card

**Wants** 2GHz CPU, 1GB RAM, 256MB 3D card

**Net gaming** Offline co-op mode

**35%**

**PCF says...** "An Xbox port that looks a little green around the gills."

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TOTAL TOTALITY

## Total War Eras

For fans of massed ranks and trebuchet-led violence, this is the complete package

Price £45 Publisher SEGA Developer Creative Assembly Web www.totalwar.com

**B**oxed sets are all the rage at the moment. Usually you'll see them for MMOs and other successful RPGs, bolstered by cloth maps, pewter figurines or (in the cheaper ones) lame stickers and postcards. Sadly, *Eras* falls into the latter category



Ah, the visceral joy of storming a Roman city at night, in the rain, on elephants...

### BUY THIS IF YOU LIKE...

- >> **Cossacks II Battle for Europe**  
Ascaron
- >> **Dawn of War**  
THQ
- >> **Battle for Middle Earth 2**  
EA



on the goodies front, but it delivers when it comes to game-hours. Every *Total War* game and all of the expansions are here, from *Shogun* to the very recent *Alexander* add-on for *Rome*.

### TOTAL WART

In some ways, it's a shame that such great games have been thrown together in such sloppy fashion. This was an ideal opportunity to tidy up the multiplayer difficulties with *Shogun*, since the official servers went down years ago. Sega/CA hasn't done that. It's still virtually impossible to play *Shogun* online, and worse, patching it's tricky. *Eras* installs with a different directory path, so trying the official patches doesn't work without manually moving files. *Shogun* should have been updated for the *Eras* Collectors' Edition, but it

It seems unlikely our blood-spattered friend here will make it through the whole series.

feels like they just didn't care. Yes we're bitter. We loved playing *Shogun* online and we're not alone.

Although the series can be seen as an evolution of elements rather than a collection of discrete games, each iteration is worth investigation. There's also an interview with *Total War* creator Mike Simpson that reveals some clues about the future of the franchise, plus insights into the development of the hugely popular series. **James Carey**

**Needs** 450MHz CPU, 128MB RAM, 64MB 3D card

**Wants** 2GHz CPU, 1GB RAM, 256MB 3D card

**Net gaming** LAN, internet

**85%** **PCF says...** "Pricy and full of missed opportunities, but the games are still so good."

CLICK CLICK, BANG BANG

## Command & Conquer The First Decade

The game that made the PC

Price £30 Publisher EA Web www.commandandconquer.ea.com

**T**he **Doom** of real-time strategy, the series that established FMV and expensive expansion packs as the norm for 1990s PC gaming – C&C has a lot to answer for, good and bad. The six C&C titles so far, plus their every notable add-on, promise hundreds of hours of nostalgic army building... or they would, if

the first few games weren't almost unbearably rustic once you're past the initial fond memories, the FPS spin-off, *Renegade*, wasn't so forgettably diabolical, and most recent offering *Generals* wasn't such unpleasantly immoral war porn. Fortunately, *Red Alert 2* and *Generals* add-on *Zero Hour* both manage to still stand proud as the sort of hugely over-the-top, high-speed sci-fi we remember C&C fondly for.

**Alec Meer**



Little men fighting at PCF's behest.

**Needs** 800MHz CPU, 256MB RAM, 32MB 3D card (with T&L)

**Wants** 1GHz CPU, 512MB RAM, 64MB 3D card (with shaders)

**Net gaming** 2-8 players

**61%** **PCF says...** "You're better off tracking down a copy of *Red Alert 2* on its own."

SHUT THAT DOOR

## Baldur's Gate 4 in 1 boxset

Potions and magic and swords – oh my

Price £15 Publisher Atari Web www.bioware.com

**H**ere's a series that stands firm against the ravages of age. Often, 2D games – especially immaculately painted fare like this superb RPG series – date far better than 3D ones. *Baldur's Gate*, and its expansion *Tales of the Sword Coast*, offer the solid, complex role-playing that misty-eyed nostalgia tells us used

to be the norm, but in fact was rarely found with this level of shine. But *BG2* and its add-on go far deeper, investing darkness, character and mystery into what often threatened to be a horridly generic fantasy world in the first game. That follow-up *Neverwinter Nights* (not included) had such a throwaway singleplayer campaign by comparison is lamentable – they don't plot 'em like they used to.

**Alec Meer**



*BG2*: depth, darkness and plot.

**Needs** 300MHz CPU, 64MB RAM, DirectX-compatible 3D card

**Wants** 500MHz CPU, 128MB, 16MB 3D card

**Net gaming** 2-4 players

**88%** **PCF says...** "The anti-*Diablo*, if you like – and all the better for it."





PCF's once-noble 'ride' is almost certainly in need of a respray.

## SMASH HIT

# Flatout 2

The smell of leaking petrol, the screech of metal on metal, the crunch of spine on pavement...

Price £30 Publisher Empire Web [www.flatoutgame.com](http://www.flatoutgame.com)

**T**he first time we rattled our rusty old banger around those dirt tracks, the memories came flooding back. That orange Dodge Charger, those implausible stunts, those denim cutoff shorts. Yes, if ever there was a game that rekindled the spirit of the *Dukes of Hazzard*, *Flatout* was it. Unfortunately, the game was as rough around the edges as welded doors and, as a result, didn't quite achieve all we hoped it would. Luckily *Flatout* has returned for another stab of the accelerator, and it's an altogether more polished beast.

### CRUNCH TIME

Quite how *Flatout 2* manages to make something as ugly as a rusting heap of automotive blasphemy look this stunning is utterly baffling. What's more, said insurance write-off will more than likely be barrel rolling through lush forests, decorated with gorgeous HDR lighting, and have hundreds of splintered items of trackside furniture bouncing down the road alongside it. This, if you hadn't already guessed, is a very pretty game.

There's also much more content to get your teeth into this time around, with

a veritable scrapyard full of vehicles to unlock and several different modes and mini games to try your hand at beyond standard racing.

New for this sequel is the introduction of street racing, with the twitchy chav chariots providing a nice contrast to the lazy handling of the derby class, and city circuits requiring an entirely different driving style. Interestingly, while the puerile ragdoll-launching stunt events can be the most infuriating part of the singleplayer game (it's simply too difficult to match the



In bad crashes, your plucky driver will be hurled bodily from the vehicle. It's hilarious.



The special event courses are some of the best in the game.

### ON THE DVD

>> Screenshot gallery

### BUY THIS IF YOU LIKE...

>> *Crashday*  
Atari  
>> *Destruction Derby*  
Psygnosis  
>> *Need for Speed*  
Most Wanted  
EA



## Launch time

The stuntman flungeth



The mini games range from stone-skipping to ski jumping, but they all have one thing in common – using the nitro button to fire your tiny driver over frankly excessive distances. You'll feel every crunch as your unfortunate pilot tumbles to earth, bouncing off scaffolding and signage. Clang!

ripped-straight-from-Hollyoaks cast of AI drivers), gather some equally inept chums around your PC for some party play and you'll have your very own idiot version of the Olympics.

*Flatout 2* is an engaging homage to *Destruction Derby*, which succeeds where *Crashday* failed, in that it produces reasonably close racing and enough variation between modes to encourage you to return beyond that first week's play. We still feel that the fundamental issue of the handling could do with more attention – facing backwards as the pack rushes past is never fun, after all – but the sheer amount of different tracks, cars and modes makes this vastly more rounded than its predecessor. **Mike Channell**

**Needs** 2GHz CPU, 256MB RAM, 64MB 3D card

**Wants** 2.4GHz CPU, 512MB RAM, 128MB 3D card

**Net play** Eight-player LAN and online

**Discuss** [www.pcformat.co.uk/mag/flatout2](http://www.pcformat.co.uk/mag/flatout2)

**82%** PCF says... "Satisfying and technically proficient carnage. Watch that bodywork fly."

## ENDEARING ENGINEERING

# Armadillo Run

Real physics, without a special card

Price £10 Publisher Armadillo Run Web www.armadillorun.com

**H**ad they been game designers, Heath Robinson and Johnny Ball would've made a game just like this. It's one part *Incredible Machines*, one part *Pontifex II* – and 10 parts your own imagination.

Your task is simple: help a balled-up armadillo reach the exit portal using simple physics. Build steel structures, link weights to rubberbands, attach rockets to

windlasses and generally have more fun with an engineering sandbox than Isambard Kingdom Brunel had in his entire life.

Everything you build costs money, though, and you must keep to a strict budget each level. The costs are cumulative, which encourages you to revisit earlier levels and build more efficient machines once you've got your head around the mechanics.

Take into account the superb built-in level editor, and the only thing missing is a running commentary by Fred Dibnah.



Efficiency? Bah! This is art, y'know.

high score  
PCFormat

**Needs** 1GHz CPU, 256MB RAM, DX8 3D card

**Wants** 512MB RAM

**Net gaming** None

**89%** PCF says... "Engrossing – if you enjoy building things, this is a must."

## POSER NOT LOSER

# Devil May Cry 3 Special Edition

Bridging the gap between Italian poetry, John Woo and Keanu Reeves

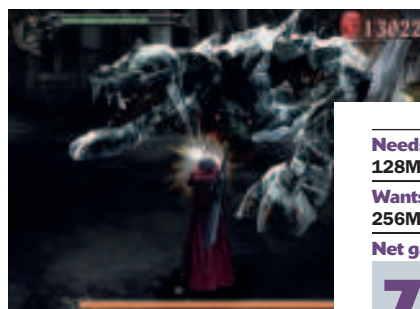
Price £20 Publisher Ubisoft Web www.devilmaycry.com

**H**ero Dante may be damnably smug, but he's the reason *Devil May Cry* works so well. Adopt his stoner attitude and you'll soon warm to this throwback to monster-bashing actioners of the 80s... Just don't blame us for the clumsy controls,

dodgy camera angles and ultra-frustrating gameplay.

Even in the Unlockable Easy Mode (a 'reward' for dying three times in the first two levels) you'll still be challenged. But at least being free from frustration allows you to feel stronger and cooler.

When being strong and cool is the point, it's not hard to swallow your pride and have fun with this.



Yeah, yeah, tell it to the sword...

**Needs** 800MHz CPU, 128MB, 128MB 3D card

**Wants** 1GHz CPU, 256MB RAM, 256MB 3D card

**Net gaming** None

**72%** PCF says... "The poser with the big sword does himself proud."

## Also out By James Carey GAMING ROUND-UP



### The Odyssey Winds of Athena

Price \$20 Publisher Liquid Dragon Web www.liquiddragon.com

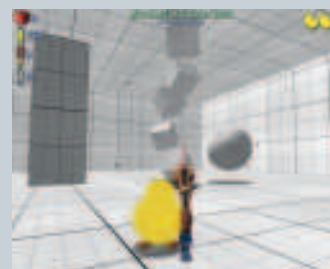
As Athena, mistress of the winds and currents, it's your task to guide gung-ho sailors – no less than Ulysses' own fleet – home to safety, past razor-sharp reefs and killer colossi (!), avoiding Cyclops, harpies and more. A detailed current physics model underpins the action, leaving you to drag currents and swirl winds as you guide your boys safely home. It's a one-trick-pony, sure, but at least it's innovative and fun.

**Needs** 1GHz CPU, 256MB RAM, DX8 3D card

**Wants** 1.5GHz CPU, 512MB RAM, DX8 3D card

**Net gaming** None

**67%** PCF says... "Fun, but neat physics offset by drab visuals."



### Kumoon

Price £Free Publisher Metal Oxide Games Web www.pakoon.com

Turn a room full of red blocks white by getting them to collide with other white blocks, but touch or shoot a red block and you lose points. You can nudge blocks, walk atop giant balls to roll them, or shoot blocks with a range of different ballistics – but you only clear a level if your score is in positive numbers by the end. With higher production values, *Kumoon* would be a welcome lunchtime distraction; as it is, the game feels too rustic for long-term play.

**Needs** 1GHz CPU, 256MB RAM, DX8 3D card

**Wants** 1.5 GHz CPU, 512MB RAM

**Net gaming** None

**68%** PCF says... "Lacks the polish to make it an indie classic."



### Cloud

Price Free! Publisher USC Interactive Media Web intihuatani.usc.edu/cloud

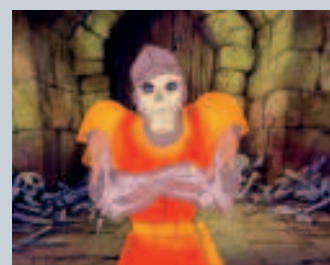
This could be the most beautiful game we've ever played, with a purity that can't fail to warm even the stoniest heart. You're a boy, daydreaming of flying through blue skies over a South Pacific paradise, and it's your task to make friends with clouds so that they follow you. You then create shapes and patterns with said clouds to finish levels, and whip up storms to divert evil acid-rain clouds. It's a sheer delight to play. It's on this month's disc, too.

**Needs** 1GHz CPU, 256MB RAM, DX8 3D card

**Wants** 1.5GHz CPU, 512MB RAM

**Net gaming** None

**90%** PCF says... "Only the bitterest of cynics will fail to be moved."



### Dragon's Lair High Definition

Price \$50 Publisher Digital Leisure Inc Web www.digitalleisure.com

This is a remastered High Definition version of the LaserDisc coin-op game devised by former Disney animator Don Bluth (the later, designed-for-the-home-market cut is also included here), and it's as tough, harsh, unpredictable and wonderfully animated as ever. The pros and cons are the same now as they always were. It looks lovely, but plays like an out-of-tune banjo, thanks to the notorious trial-and-error gameplay.

**Needs** 500MHz CPU, 256MB RAM, DX8 3D card

**Wants** A big monitor

**Net gaming** None

**23%** PCF says... "Watch *The Secret of NIMH* – or play a real game."



## First five minutes

Getting to grips with the roleplaying campaign



**1** The opening area is set before the main campaign, and gives you an opportunity to level up in the relative security of a rural civilisation at its peak. You can charge straight through this if you want, but we recommend you sit back and explore the area before it collapses into hell.



**2** Talk to the town crier, then to Sir Tydus (it's good practice to note everything down from this point on). You'll get your first quest from him, which is to meet your trainer outside the city walls. If you wander down to the west from him, you'll see your objective star. Walk through the gates.



**3** You're now in an instanced area, like everything in *Guild Wars* outside the hub cities. Speak to your trainer outside the gates, who'll offer you a new quest – to beat up some bads who are loitering up the road. Take them out, return to him and you'll get your first spells and cash reward.



### How to create a character

If you opt for the roleplaying campaign, you'd normally have to choose which story to follow (here, of course, it's Prophecies). Afterwards, you get to choose your character's profession: Warrior, Ranger, Monk, Necromancer, Mesmer or Elementalist. Then it's a swift choice of gender and straight into character customisation. Select the basic colours of your outfit, your size, face, hairstyle, skin-colour and name. Use the right-mouse button to rotate the figure and the mouse-wheel to zoom in. When you're done, click **Create**.

For the multiplayer PvP mode, you can choose between a pre-generated character and a more complicated one. Unless you've played the game before, we recommend the former.

## WELCOME TO TYRIA



### Are you being served?

If your friends are on a different server, you can join them by simply selecting here – hit **[M]** to reveal the map screen for teleporting.

### It's a small, small world

Your mini-map shows AIs, fellow players and your objective as a green star. Just above it is the button for quitting the game.

### Time to get those hands dirty...

Your Experience bar fills up to show how close you are to the next level. It also shows the level you're currently at.

### He said, she said, then they said...

The Chat window, like all the windows in *Guild Wars*, can be closed. To reopen it, or do anything else, click on the menu button (bottom-left).

### Choose your powers well

You can only take eight powers with you at a time, so select carefully before every quest.

### Wanna join the party?

Your party members are listed here. You can either join up with other heroes or select AI henchmen – click on them, then click the **[+]** icon to invite them.

### Prepare for combat

You can bind different combinations of weapons to the **[F1]-[F4]** keys by dragging and dropping them – we recommend a bow, a hand-to-hand weapon and a buffing spell.



How to play...

# GUILD WARS®

## Prophecies

All you need  
to know  
to survive  
the chaotic  
online world  
of *Guild Wars*

**Y**ou can take your *World of Warcraft* and shove it. *PCFormat* likes *Guild Wars*. Whereas *WoW* is an extremely well executed if traditional MMO, *Guild Wars* is a singleplayer RPG with optional multiplayer content and a great Deathmatch section. They're so different, we find it hard to believe gamers see them as inhabitants of the same genre.

*Guild Wars* has a plot, a crazy continent-spanning one right from the word go, not a story starting when you're at level 60, having spent 4,000 hours grinding lizards into dust. *Guild Wars* forgives you if you don't play. In fact, what's its loyalty to the gamer is one of its key strengths. Not spending every waking hour in other titles can mean you fall behind your guild mates; not here. With *Guild Wars*, you can play with characters from pretty much any level. And if you can't find someone to play with, take AI henchmen with you. They're easily as good as real people [Or at least Alec - Ed].

From the start, there are two ways to play: the enormous Prophecies campaign, a traditional RPG with a multiplayer twist, or the player-vs-player mode, where you create a top-level character specifically to knock the stuffing out of your opponents. There's less flexibility when it comes to spells, but the multiplayer action is superb.

Most battles in the roleplaying campaign are plot-developing skirmishes, but the PvP goes one step further. This is fantasy team deathmatch, capture the flag, and so on. As you battle, you get points to unlock more items - but the point isn't to unlock the items, it's to enjoy the fights; the process of playing is the end in itself, not the extras that make the battles better. You even get to represent your continent, too!

*Guild Wars* is a forgiving Gabriel to *WoW*'s tempting Lucifer. We've included a trial version on the disc (UK only) and we hope to see you in there! **PCF**

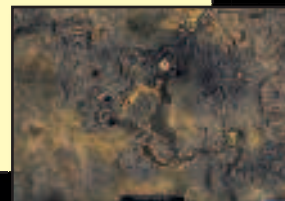
### PCFormat's five top tips

- 1 Always carry an identification kit
- 2 Salvage unwanted items for profit
- 3 Solo up to level eight
- 4 Pick a second job slowly
- 5 Try the multiplayer!

### Where next?

Past level eight, solo adventuring becomes difficult, because quests are tailored towards certain party sizes. There are two sorts of quest: explorations to unlock items and spells, and the story quests, which move the plot along and unlock higher-level areas. Mooch around one of the quest-starting areas (accessible via the Map screen - hit [M]) and ask for a group. Someone will join you. Alternatively, start a group by clicking on someone's name and selecting **Invite**.

Joining a Guild is simple. Just hang around a social area (like the main city in the roleplaying game) and you'll soon hear about one. It's best to join a Guild that has all the best bits (its own island, a good number of faction points, and so on). This helps when you get to the PvP area.







# How to build

*PCF* grease monkey **Mike Channell** teams up with Aston University students to convert their 2006 Formula Student contender into a virtual vehicle

**T**he notion was formed, as many great ideas are, on a Sunday afternoon, under a murky haze of alcohol. *PCFormat* was relaxing in front of a big screen projector, soaking in the motorsport double header of the Monaco Grand Prix and Indy 500 with a few petrolhead chums from Aston University. During the Grand Prix,

talk shifted to said chums' latest time-consuming wheeze – their entry into the 2006 IMechE Formula Student competition ([www.imeche.org.uk/formulastudent](http://www.imeche.org.uk/formulastudent)), which pits teams from universities across the globe against each other in a contest of engineering prowess.

It was a glance over their latest blueprints that inspired this jaunt

into the hitherto terrifying world of 3D modelling. *PCF* decided, rather cockily if you think about it, to parallel the team's real-world construction, showing you step-by-

step how to create an car using *zModeler2* ([www.zmodeler2.com](http://www.zmodeler2.com)), a shareware app we'd found that's designed to create mods for driving games. The plan was that by race day, July 8th, both the student team and *PCFormat* would have a shiny new racer rolling onto the track and, with the help of detailed schematics and example files on this month's disc, you'd have the skills to create a 3D car of your own. **PCF**

**“Unless you want to drive a flat piece of paper around, we need to introduce a third dimension”**





# a race car

## Student union

Introducing Aston University's Formula Student team...

Aston has participated in Formula Student since 2000, and those who build the car use their individual tasks as the basis for their final year project. Pete Thickett, for example, is in charge of suspension, but as he told us, the work doesn't end there. "We all muck in on the stuff that isn't part of anyone's project. It's a fairly close-knit team with a decent sense of humour, which helps when you're pulling an all-nighter in the workshop."

The 13-strong team has members that specialise in such diverse areas as brakes (Stuart Moss), air intake and exhaust manifold (Brent Mould) and monocoque front structure (Lee Carter, who, during his work placement, helped to construct Nigel Mansell's GP Masters car). The 2006 Aston car is one of the few in the field to use a CVT (constant variable transmission), meaning it lacks fixed gear ratios.

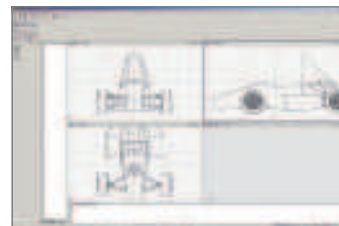


The 2006 Aston University Formula Student team gathers around its cars during the official launch.

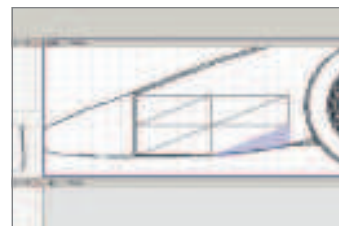
## Build a race car

### BASICS OF 3D MODELLING

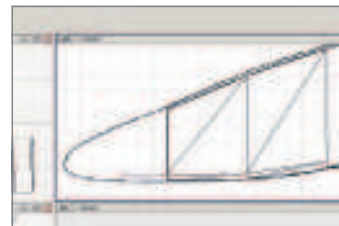
Start building your 3D car with our jargon-free guide




**1** There are three schematics on the disc, whose dimensions are multiples of 512. These must be placed in the relevant viewports (front, left, top). At the top of each viewport click **Display→Image→Select Image→Add**, and choose the relevant schematic, clicking **OK** and applying it only to the chosen view (eg. fs2left.jpg for the left view). Now for the modelling. Don't forget that handy Undo option.



**2** From the sidebar, select **Create→Surface→Grid**. In the left viewport (zoom in if necessary), drag out a rectangle on the nose cone. It won't match the diagram, so select **Vertex** mode (the first of four cube icons on the toolbar), then click your grid. Using **Modify→Move**, click and drag the vertices (red dots) so they line up as above. Click and drag on the 3D viewport to admire your work.

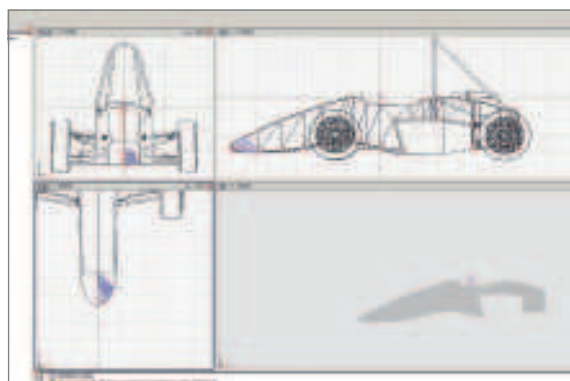


**3** The other crucial skill is creating strip polygons. Select **Create→Polygon→Strip**, then head to your grid and click an outside vertex. You'll see a line trailing from the pointer. Click out in the direction you're expanding to, then back to the next vertex, then out again, in a Z shape. **Right-click** to finish. Continue along the left of the chassis, ignoring the side pods, wheels and so on, as in fs1.z3d on the disc. 



## Extrusion

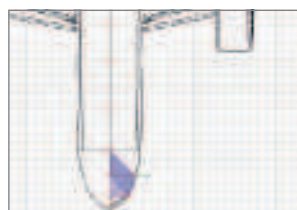
Adding some depth to that initial flat shape



So far we've worked in two dimensions, and unless you want to drive a piece of paper around the track, we're going to have to shift into the third dimension. Extrusion is where you move vertices so they line up on all three schematics, not just one. Using **Modify→Move** and the useful axis isolation buttons (the X, Y and Z on the toolbar) it's a cinch when you get the hang of it.

**"We decided, rather cockily as it turned out, to mirror the team's real-world project in 3D"**

**1** Go to the top viewport, and isolate the X axis by ensuring that only the X is selected. Then grab any of the vertices along the centre line of the plan and drag it over to the right-hand side, out to the edge of the chassis on the schematic. It's an extremely simple step, but a vital one.



**2** Glance over to the 3D view and you'll notice that suddenly your flat shape has accrued added depth. Keep moving along dragging points horizontally in the top view, following the contours of the chassis, until you've moved most of the vertices.



**3** Don't worry about coming back to meet the centre line at the rear – that hole can always be sealed up later. We're only extruding in one direction, because we'll save time by modelling one half of the car and then mirroring it to form the full vehicle.

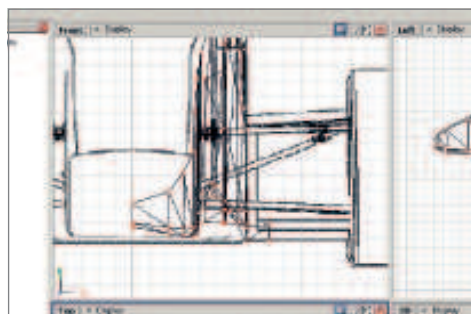


**BY NOW...** Your formerly 2D shape should have made the leap into three dimensions. You should know how to both create polys and manipulate vertices. The bulk of the modelling is a combination of these skills.

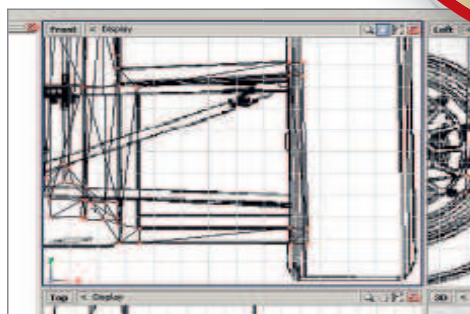
## Creating detail

Those bits that insist on being difficult

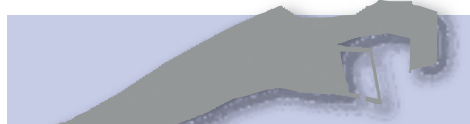
**L**uckily you have an extremely useful tool to stop your head turning to jelly at this point. Select **Display→Hide** and you can click on divided or multiple vertices, polygons or objects to hide them, ensuring you're only dealing with the vertices you want to work on. When you're done, click on **Display→Show** and everything will reappear.



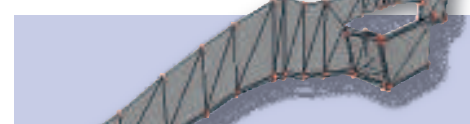
**1** We want to bring the side pod out as polygons created in front view (so that one-sided polygons are visible from outside the car) so primarily we'll be using that viewport, but first use the other viewports and the Hide function to remove all the vertices you aren't working with. Then bring a strip polygon out from the extruded chassis.



**2** Using strip polygons, create a frame with a hole in the centre for the radiator vent and reconnect it to the chassis at the top. Then, creating more polys, make a square within the frame by working concentrically inwards, as in the diagram. The square will be the radiator and the adjoining polys will be sunk in to become the inner walls.



**3** Using further isolation of vertices, hide all but the four on your inner square. Grab them in the left viewport and then drag them inside the side pod. If you like, you can then move back to the front view and drag them outwards so that the adjoining polygons become flat inner walls. Your model is gradually taking shape.



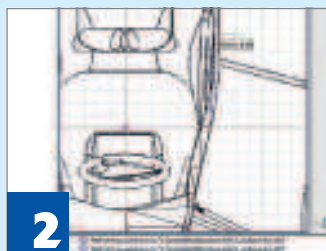


## Sealing up

Cleaning up those gaping holes from every angle



1



2



3

Once you've finished the left side, you need to work your way through the other angles, closing up the gaps. Start with the top view, creating strip polys along the car (as shown). Repeat this for the rear and underside. These viewports aren't open by default, but you can access them by clicking on the text that says 3D above the viewport. Ignore the right hand side, of course.

## Adding extra touches...

Be as detailed as you like in your creation

We've created a rollbar, suspension and wheels, all of which will be mirrored to create our car. The methodology is exactly the same as the chassis – start by creating a new grid and model from that. By making extra components discrete surfaces they can be made visible and invisible more easily by clicking the boxes in the hierarchy. We're saving the steering wheel and engine block for after we've mirrored the other side, as the block is in an asymmetrical position – so it's easier to create the steering wheel separately (see wheel3.z3d) and use **File→Merge** to introduce it to our car.

### Wheely easy

If you're creating a model for *GTA: San Andreas*, you only need to make the right front wheel – the rest are duplicated.

### In the tub

We created the cockpit in much the same way as the side pod vent earlier.

### Roll with it

Our sleek-looking rollbar is actually more square than it appears – don't worry about making it cylindrical.

### Centre caught

Try to ensure all your centre line points are lined up as accurately as possible. Zoom in nice and close and amend them if necessary.

### Creating a wheel

Go to **Create→Spline→Strip** and draw a cross-section of the tyre, starting from the wheel's centre. Don't join the line up. **Right-click**, and select **Create→Surface→Revolved**. Click on your spline and voila, a wheel. Now delete the spline.

## Make your vehicle whole

Copying, mirroring and flipping completes your car's shape



### BEFORE

Go to **Object** mode (fourth cube), use **Create→Copy** and click on each object. Then select **Modify→Mirror** and click on them again.

### AFTER

Use **Modify→Flip** on each new surface. Select **World** in the menu next to X, Y and Z, then use **Surface→Normals**, and then **Calculate**.





## Texturing

Hide your naked car's shame with a livery



**1** zModeler's built-in UV mapper handles texturing. We suggest preparing a texture similar to `fstexture2.tga` on the disc. Select your chassis in zModeler, then head to the material editor and add a new material, named it **PCFBody**. Under **Texture Layers**, click on the ... button to assign your texture. Then click on **Assign to selection** button.



**2** Having assigned your texture, you'll see it – but it will be stretched poorly across the mesh. This is where the UV mapper comes in, simply use **Surface→Mapping→Edit UV** to click on your chassis in the left viewport. Choose **Generate New** and **OK**, then click on where it says **Left** and choose **UV Mapper**. Simply move, rotate and scale the mesh until it matches.



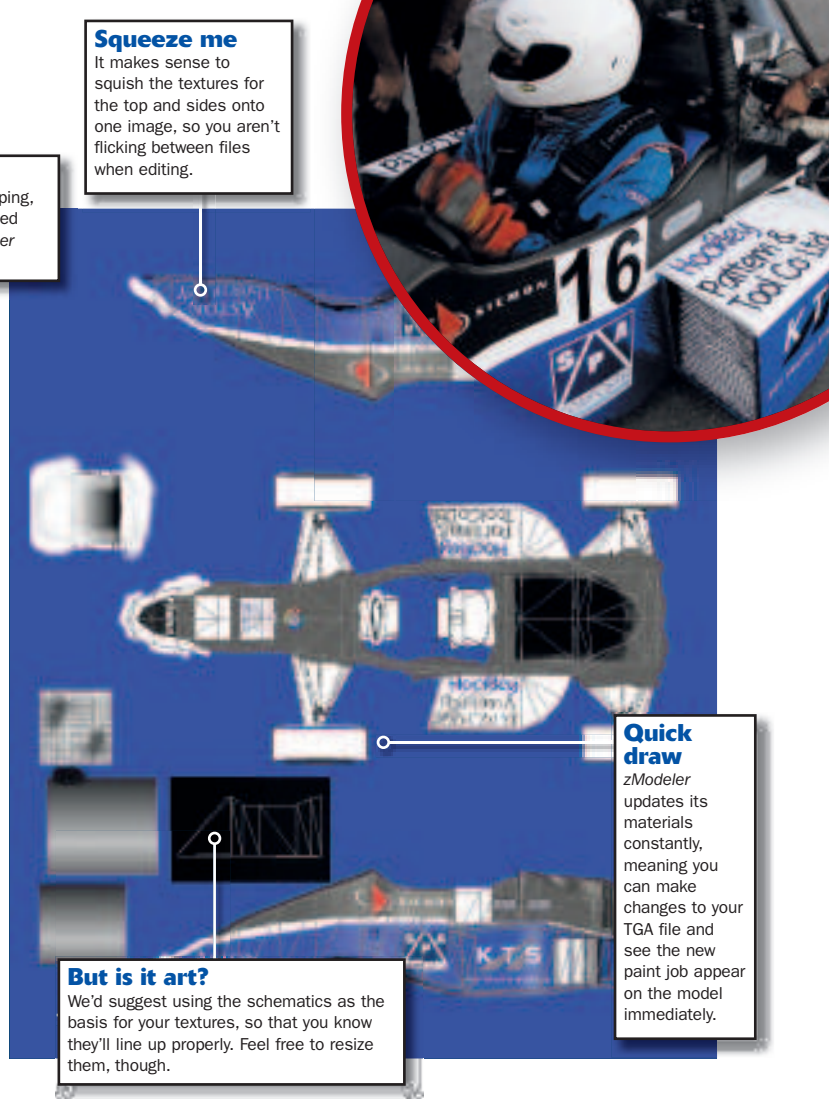
**3** It will still be stretched over the top, so switch to polygon mode (third cube), and select the polys you want to realign the material on in whichever viewport is relevant. Then go to **Modify→Submesh→Detach**, click the little square and uncheck the boxes. Click **Selected Mode** at the bottom of zModeler, click on your polys and then repeat Step 2 in top view.

### Squeeze me

It makes sense to squish the textures for the top and sides onto one image, so you aren't flicking between files when editing.

### Help is at hand

If you're stumped by UV mapping, there's an excellent specialised tutorial on the official zModeler site. [tinyurl.com/oalmc](http://tinyurl.com/oalmc)



### Quick draw

zModeler updates its materials constantly, meaning you can make changes to your TGA file and see the new paint job appear on the model immediately.

### But is it art?

We'd suggest using the schematics as the basis for your textures, so that you know they'll line up properly. Feel free to resize them, though.

GETTING YOUR CAR IN...

## GTA San Andreas

**R**eplacing a car in *San Andreas* is straightforward, as it uses dummy polygons for much of the scripting. So, you only need a right front tyre modelled just as long as you already have appropriately named dummies (made by creating a new surface right clicking on a model in zModeler and selecting **Convert To→Dummy**). Equally important is the hierarchy – that list of objects down the left hand side in zModeler can be dragged and dropped. Use the hierarchy from `sanandreas.z3d` on the disc as a guide for order and the naming conventions (particularly the need to name your car after an existing vehicle filename, and incorporate the name at the top of the hierarchy). You'll also need to use the **File→Merge** command to bring in the GTA-sized collision objects from `sanandreas.z3d`.

Scale the model to the imported collision shape by going to model mode (fourth cube along) using **Select→All**, clicking **Selection Mode** at the bottom right, and then with the **Modify→Scale** command selected holding [**Shift**], clicking and dragging. You'll then need to use

For those who are more about the drive-by than the driving

**Display→Local Axes→Center to Object** on each bit of your car.

Once you have your dummies and collision model in place, you need to save the TGA textures with **remap\_** (eg. `remap_fstexture2.tga`) in front of the names and reassign them to the relevant material in the material editor. Don't worry, your UV map will be retained. Then grab a copy of *TXDWorkshop* from the coverdisc, and create a TXD file with your TGAs in it. Back in zModeler, click the **Export** button (paper with a red arrow) and choose the **GTA DFF** file format. You should now have a DFF and a TXD file, named after an existing vehicle such as our `hotrina.dff` and `hotrina.txd`. Using *IMG Tool 2.0* (also on the disc), open `gta3.img` in the models directory of your *San Andreas* folder and, using Find and Replace functions, import your two files. Because we've replaced the Hotring racer, typing **VROCKPOKEY** in-game should spawn your car.



GETTING  
YOUR  
CAR IN...

# rFactor

Simulation  
fanatics, strap  
yourselves in and  
start your engines

**A**s **rFactor** is a mod friendly sim, there's an awful lot going on behind the scenes with many files that need to be tweaked. Luckily we've done the hard work, by preparing a zip file that will install the Formula Student car into your root **rFactor** directory. The best way to work out how to install the cars is to browse through the **GameData/Vehicles/PCF** folder opening the HDV, GEN and VEH files in **Wordpad**. Search these files for the term **PCF** and you'll find the areas you need to tweak should you wish to insert your own model. The creators of **rFactor** have made this easy, by adding hundreds of comments within the files detailing what each aspect does. The same applies to the files in the **rFm** and **Talent** directories. Use our files as a basis and you shouldn't go far wrong, so what we'll do here is tell you how to prepare your model in

**zModeler2**, export it and add it to an **rFactor MAS** file.

First, open **rFactor.z3d** and you'll notice we've borrowed the driver models from the example file on [www.zmodeler2.com](http://www.zmodeler2.com). Another must is disabling alpha blending. Do this by going into the **Materials Editor**, clicking on **Alpha Parameters** and unchecking **Enable**. Also, ensure the local axes are centred to all objects apart from the chassis. For the chassis, use **Modify→Move→Move Pivot Only** so that its pivot sits where the two centre lines meet. Once that's done, click the drop arrow next to the **Export** icon and select **Multiple Export**. Choose the **ISI GMT** filter and click to export.

All the files and textures must be collected in a **MAS** file. Grab the **MAS Tool** from the downloads section of [www.rfactor.net](http://www.rfactor.net) and pack your exported GMTs and TGAs into it, then put it in your car's directory.



## Here's how we did it...

Both teams arrive on the grid in a flurry of tyre smoke and wheelspin

Well, we all made it. Us with our virtual vehicle, and the Aston boys with their real-life racer. **PCF** was there on the day to cheer the chaps on, and the Aston car completed nine heroic circuits of the 30 lap endurance race before succumbing to electrical failure. "It was pretty unlucky," explained transmission expert and driver Andy 'Shep' Shepherd. "But up until then the car was running well, and at least we have the game version to drive until we fix this one."

So where next for a budding modeler? Well, we haven't even touched on adding bump mapping, alpha channels, damage and LOD models. There's always more detail you can add, and the best place to ask questions is the official **zModeler** forums at [www.zmodeler2.com](http://www.zmodeler2.com) and the mod friendly forums at **Race Sim Central** [www.rscnet.org](http://www.rscnet.org).

### Canadian triumph

The eventual winner was the University of Toronto, with a frighteningly well-engineered racer. Aston unfortunately came in 54th place out of 59.

### Reversal of fortunes

The Aston team will return in 2007, with a new car which will hopefully carry the guys further up the grid.

### Driving development

Keep an eye on the **PCF** blog ([blog.pcformat.co.uk](http://blog.pcformat.co.uk)) and we'll import the **PCF** racer into new racing games as the **zModeler** plugins emerge.

### Keep on moving

The perfect place to continue adding detail is the engine, there's plenty going on here, and we've included some photos from the development of the car on the disc.

### A nose for detail

As you can see, **PCF** is one of the team sponsors on both the virtual and the real race car, with our logo sitting in a prime spot on the nose cone.





# PCFormat

# on the disc

## The very best software and games

### HIGHLIGHTS

#### Settlers 2: 10th Anniversary

To celebrate the cutesy strategy/management game's first decade, Ubisoft is re-releasing the brilliant *Settlers 2*. It's got a new 3D engine and a few tweaks, but it's still the same great game.



### On your disc

#### Full programs

Our discs deliver top-quality, high-value apps and utilities. Let us know if there's something you want and we'll do our best to get it for you.

#### Play the best games

Don't wait hours to download this month's best games demos. They're all here, right now.

#### New games for old

It's not all about the latest and greatest. Every month we have a selection of the best mods and add-ons for your existing titles.

#### Who needs manuals?

We want you to get the most from your free programs. *PCFormat* features more software guides than any other PC magazine in the whole wide world. Sometimes.

### PLAY THIS



#### Night Watch

Police the forces of darkness in this turn-based RPG

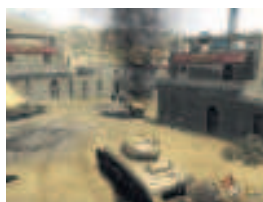
**LMB** Action  
**RMB** Move camera  
**MSWheel** Zoom  
**I** Inventory



#### Glory of the Roman Empire

Veni, vidi, vici, and all that Latin jazz in between

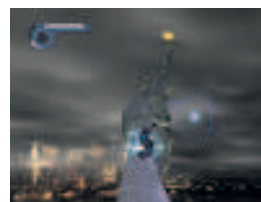
**LMB** Select  
**RMB** Build menu  
**MSWheel** Zoom  
**Mid MB** Pan/tilt  
**Csr Keys** Move camera



#### Panzer Elite: Dunes of War

Life's a beach when you're bouncing around in a tank...

**W,S,A,D** Movement  
**LMB** Primary fire  
**RMB** Secondary fire  
**B** Binoculars  
**M** Map



#### X-Men: The Official Game

The console action-fest mutates into a PC game

**W,S,A,D** Movement  
**Space** Jump  
**L** Heavy attack  
**J** Quick attack  
**;** Special move



#### Pro-Cycling Manager 2006

All the fun of pro push-biking without the leg wax

**CTRL** Select all  
**LMB** Select  
**RMB** Actions  
**P** Pause

### REGULARS

#### Buyer's guide

That wad of cash burning a PC shaped hole in your pocket? Check out our monthly updated buyer's guide as to what's hot.

#### Benchmarks

Who do you trust? Us obviously, and that's because we've got all our own independent benchmarks of all the latest kit.

#### Latest drivers

Getting those few extra frames per second can sometimes simply be a matter of keeping your rig up to date. Check here for the latest drivers.

#### All the apps you need

51 seconds is, on average, all it takes for a fresh install to get infected. Make sure you're protected with our life-preserving software.

Flex those adamantium claws in our X-Men demo



Get **PCFormat** delivered to your door every month...  
Subscribe now on page 134

#### YOUR CONTACTS

In the very unlikely event that you have a problem with your disc...

DVD problems on the web: [www.futurenet.co.uk/support](http://www.futurenet.co.uk/support)

By email or phone: [support@futurenet.co.uk](mailto:support@futurenet.co.uk), 01225 822 743

If all else fails check out our forum: [forum.pcformat.co.uk](http://forum.pcformat.co.uk)



# workshops

## Get more from your PC today

**OUR PROMISE**  
Every month we bring you the biggest and broadest selection of tutorials around



## Silence is golden

Your rig sounding like it's about to take off every time you touch the power button? We feel your pain. Find out how to keep the noise down here

121



### Modulate your vocal talents

Change your voice from its normal dulcet tones to a hideous mockery of its previous self with just a few simple clicks

**Full software**

122



### Create your own mystery island

Using the powerful editor in *Oblivion*, we show you how to create an island in the verdant land of Tamriel

**Software toolkit**

126



### Tune and tweak Windows XP

Using this surprisingly powerful optimisation suite you can tune practically all aspects of your Windows installation

**Full software**

## DO THIS

Let those creative juices flood out

### 116 Quiet please

Hush down that noisy beast sitting on your desktop. And your PC too.

### 120 Flipping photos

Want to bug everyone with your holiday snaps? Do it digitally with *FlipAlbum*.

### 121 Vocal gymnastics

Dalek impersonations abound with our guide to using *Voice Changing Software 3*.

### 122 Play god

Part one of our guide to creating your very own island in *Oblivion*'s incredible editor.

### 124 Sharper image

Clean up any video with the post-processing power of *Neuview* video player

### 126 Speed freak

Plug the probably gaping holes in your Windows installation with this multi-purpose tool, *PC-Optimiser 6.1*



For a full list of everything on the disc please refer to the disc's interface. Controls for the games are listed there too.

## ON THE DISC

Check out the 'on the disc' boxout in each workshop to find out what other relevant programs are waiting on the PCF disc, as well as how to install or upgrade new apps.





## James De Vile explains why nowadays, liquid cooling isn't such a bad idea...

This month's hardware features have something of a beginner, intermediate, advanced feel to them, and concentrate on silencing, cooling and overclocking. If you've skipped the latter two from fear, you really shouldn't. Especially cooling, as water-cooling systems are the holy grail to a silent PC. It used to be for the elite alone. Those choosing to unite their system's delicacies with highly conductive liquids created all manner of unholy devices using car radiators, fish tank pumps, carefully soldered copper water-blocks and wine makers' siphon tubing. The occasional dismayed reports of leaks and seized pumps were a constant reminder to us fan-cooled types that the line between creating a performance PC and destroying one was fine.

### COOLING ON THE CHEAP

Now, however, water cooling has become much more accessible, thanks to various properly engineered products appearing on the market. Both Zalman and Thermaltake offer external, all-in-one solutions to safely liquid-cool your entire system, but you'll need to find room for the enormous radiator towers both kits are supplied with. If you prefer a more transparent solution, a pick'n'mix selection of pumps, radiators, reservoirs and cooling blocks is also available (as on page 44) all designed to work together in keeping your system cool but dry. The performance difference isn't always huge, but if silence is paramount, there really is no better solution.



Have your say [forum.pcformat.co.uk](http://forum.pcformat.co.uk)

### Power supply

A modular power supply with removable braided cables such as this Hiper Type-R will free up space and improve airflow. Use tie-wraps or Velcro to secure cables to either side of the drive cage, leaving a central passage for air to pass through.

### Drive enclosures

The hum of a single drive spinning can amplify through your computer's chassis and the floor. Locking your disks in a prison of foam and metal will eliminate unwanted drive noise – we've used Scythe Silent Drive enclosures for our system. You'll need a spare 5¼ inch bay for each enclosure.

### CPU cooler

A passive or cooler will silence your CPU whilst keeping it well within safe temperatures. This Scythe Ninja Plus can operate passively, although some high-end CPUs will require the included 120mm fan at low speed.

### Motherboard

This Abit AT8-32X uses a passive heatpipe to cool its chipset, doing away with the standard northbridge cooling fan. You'll need good airflow to cool the heatpipe, though.

### GPU cooler

Whilst they'll do their job, stock coolers aren't quiet. An after-market cooler such as this Arctic Cooling Accelero X2 will keep noise to a minimum, and often beat your card's original temperatures by a few degrees, too.

### Acoustic padding

Various soundproofing kits are available; these work by absorbing the sound waves as they bounce around your case. If you can get past spending good money on a pack of rather low-tech grey foam, you'll be rewarded with sweet tranquility.

# Silent but deadly

Your rig may have all the power of an F15, but it needn't sound like one, says James De Vile

**T**he typical gaming rig is a cathode-lit monster, sporting more drives than the PGA tour. Its rightful place is beside you on your desk, bathing your room in its sinister glow, and, in most cases, making a considerable racket, too. Psychologists will tell you that silence is important, as monotonous

noise inhibits brain activity and decreases alertness. For anyone trying to use their high-end PC for work or creating music or video, system noise can be extremely distracting; even when gaming, the high whine of your fans could mask the chirrup of an advancing headcrab. Whatever you use your PC for, noise annoys. Here, then, is



## Fanbus

A fanbus or rheobus allows for manual speed control of your case fans – use a program such as *SpeedFan* to monitor your system temperatures and find a happy medium between cool and quiet.

## Exhaust/intake fans

Look for fans with the lowest noise level (dBA) and highest air volume throughput (CFM). We've used C-Series AcoustiFans, as although they're designed purely for silence, they still push a very respectable volume of air. A blowhole in the roof of your case will help to remove hot air as it rises.

quantity. Look for fans with oiled sleeve bearings, as they'll be far quieter, and install a fanbus, providing manual control. Even at low speed, a 120mm fan at either end of the case will do the work of two or three smaller fans. Whilst intake is important, it's vital that hot air is pushed out immediately, so exhaust fans should always be kept at maximum speed, especially for gaming. You'll notice that we've added an extra blowhole fan to the roof of our case; this is designed to stop the accumulation of rising hot air. Use rubber mounts to attach your fans, too – this will stop any vibration resonating through your case.

## THE SCIENCE OF SILENCE

While NVIDIA aficionados enjoy the blissful hush of their 7900s, those of you flying the ATI flag will be very aware of your card's acoustic shortcomings. Thankfully, you needn't put up with the unholy roar in order to stay loyal; various 'after-market' coolers are available, all of which do a better job of cooling the card at near-silent levels. It's the same story with CPU coolers – the fan your processor retailed with will do the job, but it'll make a lot of noise about it. Around £30 will get you an almost silent cooler that is vastly more efficient. The best coolers comprise of a number of fins, linked via copper heatpipes; Zalman and Scythe both produce excellent coolers using this design. All heatsinks rely on effective heat transfer from your CPU, and for this there are really two options – use the thermal pad that comes with your cooler, or go for a compound such as Arctic Silver or Ceramique. Whilst Arctic Silver is the tried and tested choice for Pentium 4 and Athlon 64 processors with no exposed components, it can become electrically conductive under pressure; for that reason, we recommend a ceramic-based compound if your CPU has a small die surrounded by resistors.

A post-assembly stress test is vital; mobos will allow you to monitor temperatures in the BIOS, but this can't be used to provide readings under load. For a reliable test, you'll need to monitor from within XP. If you own an Abit motherboard, it'll come with a utility called *uGuru*; it does a good job of monitoring your system and alerting you to any dangerous levels. For other boards, try *SpeedFan* or *Motherboard Monitor*. Next, grab *HeavyLoad* off this month's DVD; it's designed to test your system in the same way a 'next-gen' game would do. If your computer starts frantically beeping, restarts, or you see temperatures rising rapidly, something is wrong – check the heatsink is correctly fitted, and that airflow to your motherboard's northbridge isn't being obstructed by drives or cables.

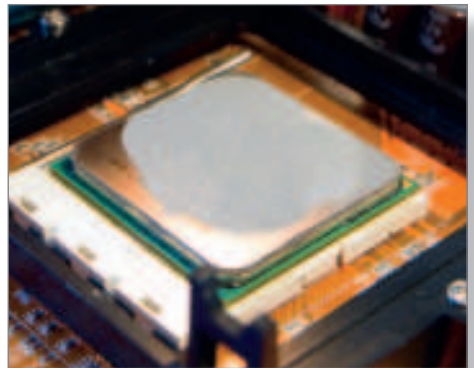
If twiddling isn't for you, let your PC look after itself. AMD processors feature a 'cool'n'quiet' speed-stepping system; once the driver is installed, your CPU will vary its clock, fan speed and power consumption to cope with the workload, giving your case fans some time off. *SpeedFan* can also track your temperatures and adjust fan speeds to compensate. If you're sticking with your graphics card's cooler, take a look at *ATITray* or *NVIDIA nTune*; both allow adjustment of your Radeon or GeForce card's fan speeds – but remember to test any changes you make. **PCF**

## Quiet please

### Silent running for all



**1** If you've been using a stock cooler on your processor for a long time, odds are it'll be pretty strongly attached – twisting the cooler will avoid ripping the CPU from its socket. To shift a graphics card heatsink, remove the screws from the reverse of the card; it'll detach easily.



**2** Once you've removed your old heatsink, you'll find your processor coated evenly in silver-coloured gunk, which has to go. If your new heatsink comes with a pre-applied pad, we'll assume you've decided to get rid of it, too. Follow these same steps to dissolve the pad.



**3** Carefully apply a few drops of ArcticClean Thermal Compound Remover to the affected area, and it should remove all traces of thermal paste. If you're on a tight budget, isopropyl rubbing alcohol over 90% purity will do the trick.

## Turn over to finish the tutorial...



our guide to silencing your system without compromising on power, and even improving cooling performance in the process.

## WIND TUNNEL

Before beginning your silencing operation, it's important to understand how heat moves within your case. You can cover your system in fans, but there's no reason why that combination will perform any better than a single, well-placed exhaust. Air needs to follow a path, to ensure that hot air is not recycled. The ATX specification defines the design at its most basic; pull cool air in from the front over your components, and push hot air out the back. Most cases come with two intake fans and one or more exhaust fans, but cheaper cases tend to replace quality with

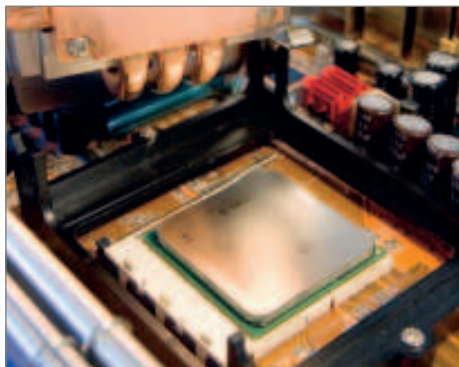


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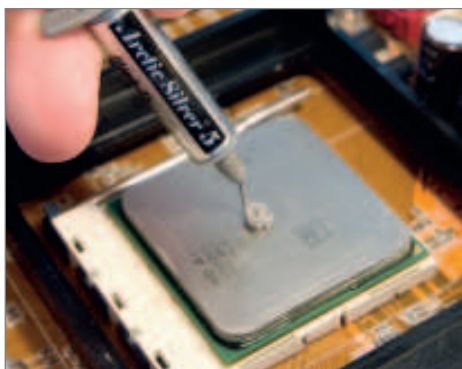
Time to break out the thermal paste...



**4** Using a lint-free cloth – a clean glasses cleaning cloth will do fine – remove every last iota of thermal compound. The ArctiClean pack comes with a second bottle of Thermal Surface Purifier; again, apply a few drops, then wipe clean.



**5** Make sure both cooler and processor surfaces are now completely clean and that any purifier has evaporated – even dust or hair can reduce the cooler's effectiveness. Here's our shiny Athlon 64 processor, ready for fresh compound application.



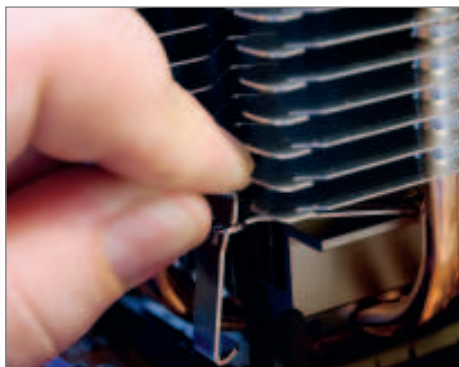
**6** You need dot of thermal paste the size of a grain of rice, half that if it's a graphics card, placed dead centre. A little of this stuff goes a very long way (just ask Tech Ed AI). If you're replacing your graphics card's cooler, you'll need to stick heat pads to the memory before you continue.



**7** This next step's for graphics cards only – depending on the after-market cooler you've chosen to install inside your rig, you'll need to fix either heat pads or small heatsinks to each memory chip. This is a deceptively simple process, but requires a bit of precision.



**8** Align the heatsink above the processor, and then put it down evenly. Pentium 4 and Athlon 64 users will need to twist the heatsink 20° one way, then the other to remove any air bubbles and creates an even circle of compound. Don't move it at all on a GPU though.



**9** CPU coolers can now be locked into place with the supplied fixing mechanism. 3D card modders, you'll need to tighten the card's screws diagonally in order to achieve optimal pressure. If your chosen cooler uses a fan, connect it – you're now good to go.

## Testing rigs

Those settings in full...

**W**e managed to cut our system's ambient levels by 25dB – nearly 80% quieter than our stock system. Processor temperatures were dramatically improved, too, although our northbridge temperatures rose due to the proximity of our passive CPU cooler.

**STOCK SYSTEM:** AMD Athlon 64 3500+ Venice with stock CPU cooler, ATI X1900XTX with stock GPU cooler, Coolermaster stock case fans (unregulated), OEM 580w PSU, two Western Digital Caviar 180GB drives.

**PCF SILENT SYSTEM:** AMD Athlon 64 3500+ Venice with Scythe Ninja Plus cooler, ATI X1900XTX with Arctic Cooling Accelero X2 cooler, AcoustiFan C-Series case fans, Hiper 580W Type-R, two Scythe Silent Box drive enclosures (WD Caviar 180GB).

**TESTED WITH:** HeavyLoad, Oblivion (1,920x1,200, all settings maxed).

	STOCK SYSTEM	PCF SILENT SYSTEM
Sound level (inside case)	59dB	27dB
Sound level (from 1m)	47dB	22dB
CPU temp (Passive)	N/A	Idle 28°C Load 52°C
CPU temp (Fan)	Idle 46°C Load 58°C	Idle 21°C Load 40°C
GPU temp	Idle 65°C Load 91°C	Idle 41°C Load 79°C
Northbridge temp	Idle 27°C Load 34°C	Idle 47°C Load 54°C

These Silent Drive acoustic enclosures will keep your disks cool and quiet.



IN ASSOCIATION WITH





# Create a photo album

Karl Foster shares and organises his pictures with *FlipAlbum 5*

**S**haring your photos with others can be a pricey and sometimes time-consuming business. Running off prints from a home printer or via a bureau costs a fair whack, then there's the hassle of stuffing them into a presentation wallet – hardly the most customisable medium. Better, then, to do things digitally.

*FlipAlbum* provides a quick and easy way to prepare digital photo wallets, and thankfully, you don't have to be a genius to use it or view the results. Just name the shots – assign numbers if you want them in a specific order – pop them into an appropriately named folder and point *FlipAlbum* at it. The software does the rest for you, although you can customise what it produces to suit the images. Once the software is launched and registered, a wizard dialog pops up and guides you through the initial album set-up. *FlipAlbum* handles a good many file types, including industry standards JPEG and TIFF, so

no matter what kind of camera you've got, its output will be read.

## ON A THEME

There's a limited number of album themes bundled with our on-disc offering, but you can get an idea of the results possible and ponder

whether an upgrade is worth your money. Once the album is generated, click on the cover to see it flip, in animated fashion, to a contents page and thumbnails, all of which are clickable links so you can jump to any point in the presentation in a trice.

To demonstrate some of the custom functions available in *FlipAlbum*, we've hightailed it to France to shoot a few frames at a football match. Our images were initially worked on in *Photoshop*, although *FlipAlbum* has some editing tools on board, and cropped to 6x4 inches at 300dpi ready for printing. However, we're also going to use *FlipAlbum* to distribute the best photos digitally. **PCF**

**"Provides a quick, easy way to prepare digital photo wallets"**

## Multimedia magic

Create your own audiovisual presentation in mere moments

*FlipAlbum* is not solely concerned with displaying photos on your computer. This versatile little application also enables you to add audio to an album so that the recipient can hear a commentary, your cutting-edge musical noodlings, or whatever else is defined in the playlist editor accessible via the Audio button. WAV and MP3 file formats are both supported, as is MIDI. Other multimedia objects, such as MPEG video, can also be embedded by clicking on Insert.

And in the unlikely event that the recipient doesn't actually have a PC or Mac, *FlipAlbum* has a built-in CD burning function that can create discs for playback on most modern DVD players. You can elect to burn a single photo album to a CD-R or place multiple albums onto one volume. There's also the facility to export the production as a slideshow to MPEG, AVI or direct to Video CD. Additionally, a 'pop and play' feature means that PC owners can just whack in the disc and it'll play automatically. Mac users, meanwhile, have to launch a dedicated viewer program manually first.

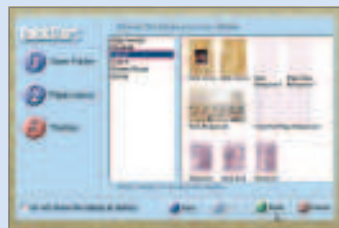


## Personal pages

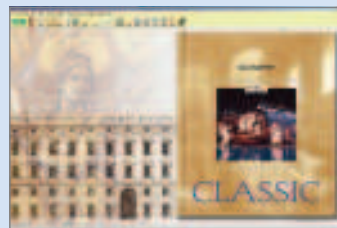
Customise your presentation with *FlipAlbum*'s editing tools



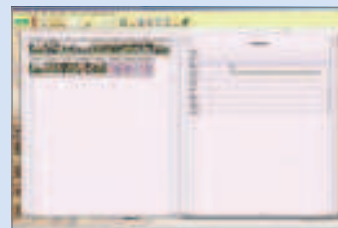
**1** Each image in the *FlipAlbum* can be given a caption in whatever font you have on the system. The **Annotate** button is actually two buttons, one for the left page and one for the right. Click to open a text box, choose a font from the dialog and key in the text, repositioning it with the **Select** tool.



**2** *FlipAlbum* contains a variety of image-editing tools, accessible via **Edit→Image Edit**. Our original shot is looking a little soft, so we've gone to **Edit→Image Processing** and selected the **Sharpen** tab to enhance definition. Special effects filters and other tools are also available from the menu.



**3** All good football teams have a logo and sponsors, so it's best to include them, or whatever clipart you fancy. Head for **Insert** to bring up the **Insert Multimedia Objects** dialog, then click and drag an item from the dialog to the page. Clicking **Select** enables you to position the element to perfection.



**4** The album needs to reside on an FTP server before it can be emailed, so click on **Upload** to copy it to an account with *MyFlipBooks*, or use the **Advanced** option to define your own FTP server. Then fill in the email fields and bask in the glory that accrues from your audience's appreciation.

# Digital voice modulation

Tim Edwards impersonates a *Mysteron* with *Voice Changing Software 3*



Your chance to make funny voices without a helium balloon.

**M**ysterons: constant threat to planet Earth, regularly thwarted by Captain Scarlet. Gerry Anderson's best baddie foolishly announced their dastardly plots to SPECTRUM at the start of every episode of *Captain Scarlet* in deep, booming, menacing tones. And then promptly failed to carry out their threats. We can change this – by dialling down the problem and impersonating their voice.

To wit: we'll be ordering a Chinese takeaway, while using *Voice Changing Software 3.0*. VCS intercepts any audio input, and fires it straight back through your speakers, or to any software, at the tone you choose. It also helps if you have a hands-free kit or speakerphone. All the software you need is provided on the PCFormat DVD (see page 6), but you'll have to provide some registration details – easy instructions for which are included in the installer.

VCS will work with a live audio feed (great if you want a robot voice for digitised smack-talk during online deathmatches), but the results can be a tad hit and miss. It's far better when used to make finely-honed samples, as we're going to do for our telephonic jape. You'll also need a microphone, and a phone you can hold up to your speakers (alternatively, use an app that'll play any audio from your PC down the line).

One thing to bear in mind: only call a Chinese takeaway that you don't mind being blacklisted from if it all goes horribly wrong, as it probably will. **PCF**



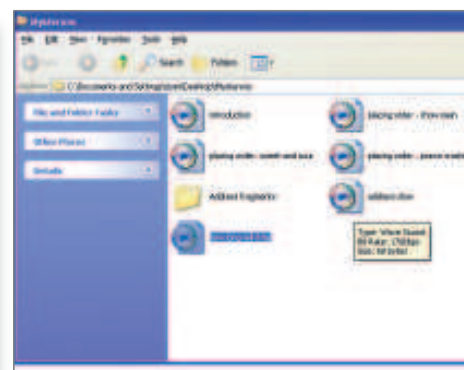
**1** Once the program's installed, run it from the **Start Menu**. To check that your mic is installed, speak into it and, after a tiny delay, you should your voice repeated. To alter the sound, simply shift the dot in the centre of the blue screen.



**3** Recording time! Shift the dot on the blue screen towards the bottom-left – deepening your voice. Speak into the mic normally and listen to the results; tweak the timbre by tapping the direction keys. Once you're happy, click **Record** and say your lines.



**2** Now to script seven conversation trees. Start with **"THIS IS THE VOICE OF THE MYSTERONS! I'd like to order a meal for delivery!"** and end with **"THANK YOU!"** Include options for **"Could you repeat that?"** and, of course, **"PUNY EARTHLING!"**



**4** With a prank like this, the trick is to save fragments of sound with obvious titles. That way, you can quickly click and play them when required. By the time you're done, you should have a directory of sound effects with suitably pithy titles.

## ON THE DISC

### Audacity

This comprehensive audio editing package gives you total control over sound recordings. Use it to cut and crop files to fit, or to record the final conversation. [audacity.sourceforge.net](http://audacity.sourceforge.net)

### MediaJoin

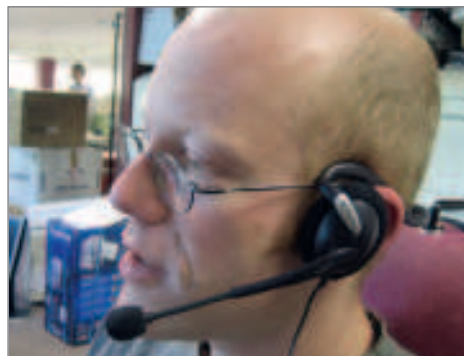
Now turn your snippets of chat into a single file (they'll make great XP startup sounds!). [carnetech2000.net/pages/mediajoin.html](http://carnetech2000.net/pages/mediajoin.html)

### BitComet

Jokes aren't funny unless someone's around to hear them. BitComet enables you to upload your creation to any torrent site. You can amuse the *entire net*! [www.bitcomet.com](http://www.bitcomet.com)

### Skype

AVC also works during live conversations. Now you too can convince pals and workmates that you've been possessed by the spirit of Satan... [www.skype.com](http://www.skype.com)



**5** Practise on a friend before you do the prank for real. Explain what you're doing and ask them to run through the conversation with you. Be prepared to rework your recordings when it all goes pear-shaped. Doing this will help you iron out any mistakes.



**6** And now? To order, of course! Dial the number and hold the phone's mic next to your speakers. Double-click the **"GREETINGS, MORTAL"** file and say hello to your new friend. If they don't immediately hang up, continue with your prepped conversation.



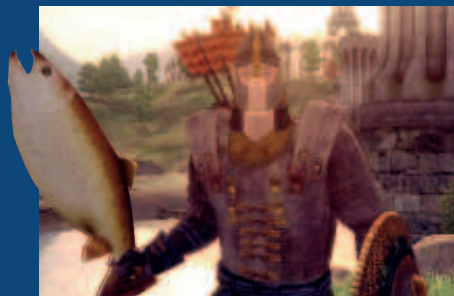
Tom Francis exposes the deviant, fantastic creations of *Oblivion's* huge army of modders

*Oblivion's* Construction Set lets you edit virtually any aspect of the game fairly easily, and create mods that can then be used in conjunction with others. This means that not only can people tweak anything, but it's actually worth doing so because players don't have to stop using their other mods to add in yours. As a result, the *Oblivion* mod community is enormous, and full of some of the most bizarre and wonderful creations ever to grace gaming.

Take the Hell Hat ([www.tessource.net/files/cache/5160.html](http://www.tessource.net/files/cache/5160.html)). It's an attractive garment, but it kills its wearer instantly. Sneaky players can slip it into a character's inventory, whereupon they'll find it and put it on. The perfect crime. For a more humiliating attack, there's the Fish Club ([www.tessource.net/files/cache/5088.html](http://www.tessource.net/files/cache/5088.html)) – a trout with which to slap your foes silly.

### SIR PANTSALOT

But these are positively mainstream in comparison to some of *Oblivion's* more specialised mods. Tamriel's Glittering Geology ([www.tessource.net/files/cache/5075.html](http://www.tessource.net/files/cache/5075.html)) adds precious minerals and metals to the game. Adults Only Oblivion ([www.tessource.net/files/cache/5210.html](http://www.tessource.net/files/cache/5210.html)) provides you with a 'special' companion: a young Imperial lady with a selection of provocative outfits and innuendo-ridden one-liners. Others are self-explanatory: Big Fat Giant Race, Less Creepy Guild Porters, Faster-Turning Horses, and finally our runaway favourite: Hello Kitty Underwear.



And now for something completely different. Just imagine this working in multiplayer.

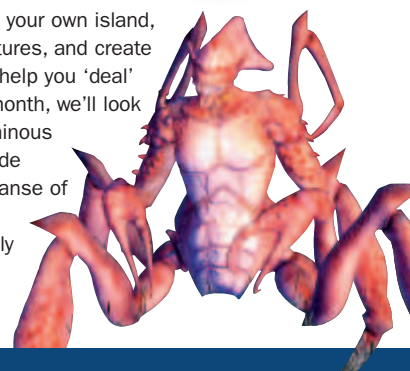
Have your say [forum.pcformat.co.uk](http://forum.pcformat.co.uk)

# Build an island in Oblivion

part  
1 2

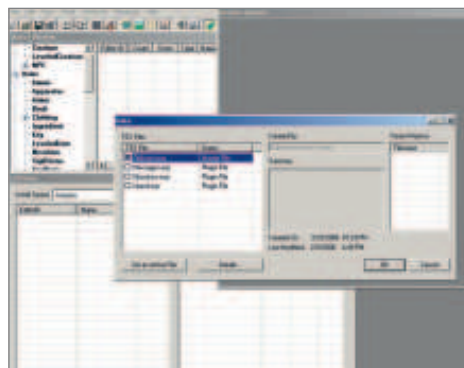
The first thing Bethesda did when it planned *Oblivion* was create the editor. When you're building such a huge world with so much going on in it, it pays to spend a lot of time making the editor powerful and easy to use. So the entire game, apart from artwork, is made in this one 6MB app, which is now freely available. And it is easy to use, if you're an experienced game developer. The rest of us, though, will need a few pointers. We'll show

you how to create your own island, infest it with creatures, and create a new weapon to help you 'deal' with them. Next month, we'll look into adding an ominous abandoned lakeside villa for you to cleanse of ghosts, relieve of loot, and eventually live in. **PCF**

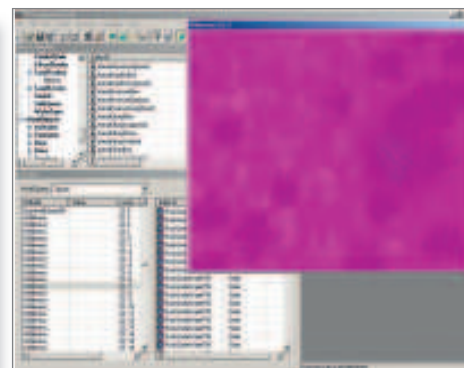


## Landscape gardening

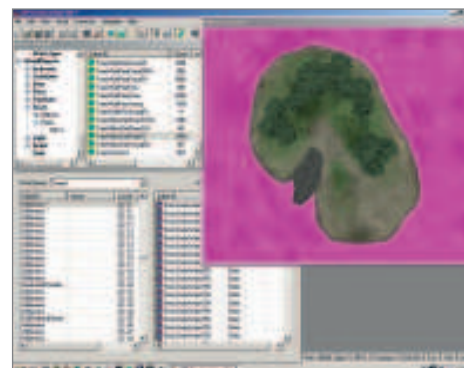
Resculpting *Oblivion* for your own evil ends



**1** We don't want to make a game from scratch – although if you do end up creating *The Elder Scrolls V*, let us know. We want to mod *Oblivion*, so first we have to open it in the editor. When you start up the Construction set, go to **File→Data** and check **Oblivion.esm**, then click **OK**.



**2** We want to create an island, so let's find some water. There's a nice big expanse at Niben Bay, so click on the **Cell View** window, click on the **WorldSpace** drop-down menu and find Tamriel. Click on the **Location** column to sort by that, and look up **Wilderness** at (22,-8). **Double-click** it.

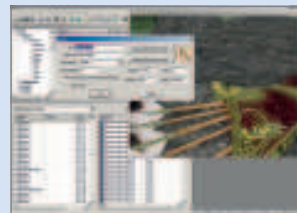


**6** It wouldn't be Tamriel without some flora. Select the **Object** window and find **Trees**. Zoom in close to the ground, then drag any flora you like to the render window. Press **[F]** to drop them to ground level, then hold **[Z]** and drag the mouse down to sink them a little further in.

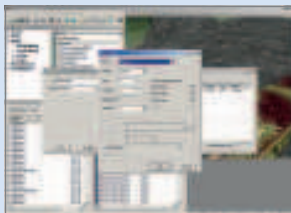
**"Apart from the artwork, the entire game is made in one 6MB app"**

## Slings and arrows

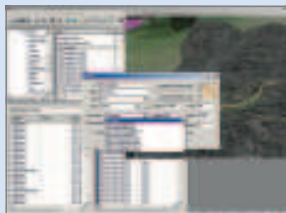
How to craft bespoke weaponry for the discerning adventurer



**1** Creating a new item means editing an existing one, and saving it with a new name. Find an arrow in the **Object** window, and double-click it. Change its ID to **Death Needle**, crank its damage up to 2,000, and click **OK**. Now drag that new item to the world.



**2** For magical weapons, first you need to go to the **Enchantments** category in the **Object** window. **Right-click**, hit **New**, then **double-click** the list on the right to add magical effects. Add **Paralysis** for five seconds, and save it as **BownageEnchantment**.



**3** Now find any bow, change its name to **Bownage**, and select **BownageEnchantment** from the **Enchanting** list. You'll have to enter a suitable value in the **Enchantment** text box, which will be its amount of charge. Now give it a go in-game.

## ON THE DISC



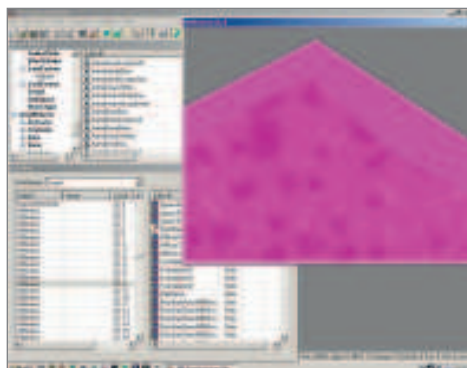
**TES Construction Set**  
The Swiss Army knife of *Oblivion* modding—change landscapes, weapons, monsters, quests, AI behaviour, textures and sounds. [www.elderscrolls.com/downloads/updates\\_utilities.htm](http://www.elderscrolls.com/downloads/updates_utilities.htm)

**Blender Construction Set**  
Boasts a potentially unlimited repertoire of beasts—start designing your own foul beings with this easy to use 3D animation app. [www.blender.org](http://www.blender.org)

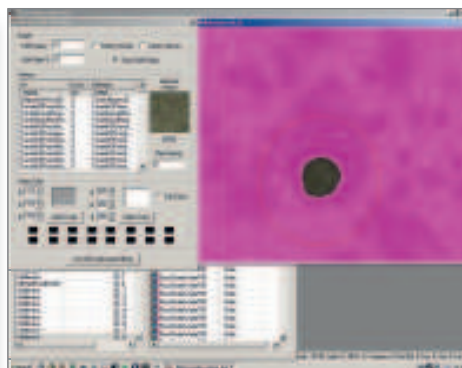
**NVIDIA Graphics Drivers**  
The most demanding game of the moment requires up-to-date drivers you can lay your hands on to run at its best. [www.nvidia.com](http://www.nvidia.com) [www.ati.com](http://www.ati.com)

**Adventure Game Studio**  
If the slings and arrows of outrageous goblins besieging you in *Oblivion* aren't entirely to your taste, why not design your own point'n'click adventure game? [www.ags.com](http://www.ags.com)

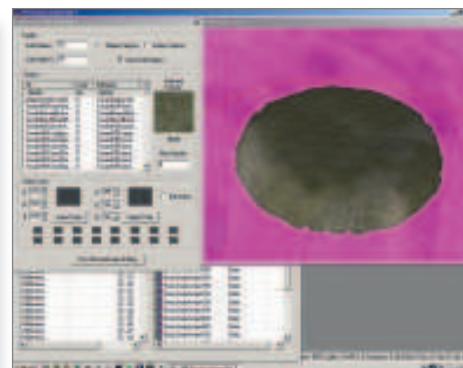
**NEXT MONTH**  
**SET UP HOME IN-GAME**  
WE'LL TAKE YOU THROUGH BUILDING YOUR OWN HOUSE—AND NEW WEAPONS—ON YOUR ISLAND



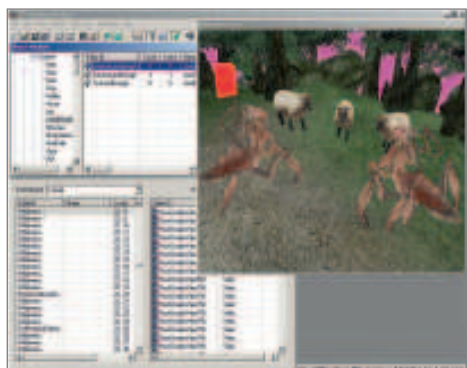
**3** Oblivion is divided up into square 'cells', and you've just loaded a watery one. Press **[A]** to brighten the view, then adjust the angle by holding **[Shift]** while moving the mouse, or scroll around with the arrow keys. **Double-click** the cell again in **Cell View** to reset your view of it.



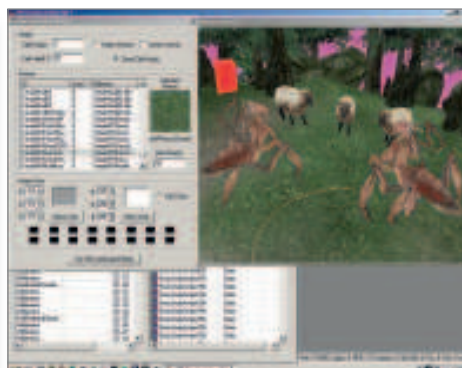
**4** Click on the **Render** window and press **[H]** to bring up the landscape tool. Change the brush size to 15, then hold down left button in the middle of the cell, and drag the mouse up. Release the button and repeat the process all over the area until a chunk of land rises out of the water.



**5** Clicking and dragging down reduces the land's height, and checking the **Soft vertices** box lets you smooth out crags. Smooth out your island a bit now if you like. Keep holding **[Shift]** to move the camera around and get a feel for how your island looks in 3D.



**7** Now to make things interesting. The **Actors** category in the **Object Window** contains all the critters you could want. Drag two Land Dreugh over, and a few sheep for them to sink their claws into. Press **[F]** to drop them to the ground, but obviously don't use **[Z]** to sink them in.



**8** The final beautification is texturing. Press **[H]**, and select a grass texture and a small brush size. Paint with the right mouse button, and that area will have lovely swaying grass in-game. Adjust the **Opacity** figure to blend in other textures, like sand and dirt near the water's edge.



**9** Time to name the island! Find **Map Marker** under **Static**, place it on your island and double-click it. Under **Marker Data**, give it a name and check **Visible** and **Can Travel To**. Save your mod, then when starting *Oblivion*, click **Data Files** and check your mod's box to play it.



# Improve any video

Richard Cobbett *cleans up web movies with Neuview*



**C**lose your eyes. Not all the way, just a little, until everything's nicely blurred. You know. Just like damn near every video that you might download from the internet.

It's a sad truth that digital video tends to look less than pristine. Compression is all-out war on sharpness and colour depth, leaving most files washed out and blotchy, and most video players simply can't do anything about it. Neuview is very different. Instead of simply playing videos, it runs basic post-processing filters on them as you watch. It can't work miracles. It can't make old footage from the Forties look like a modern DVD release, and it can't put lost data back into the image... but it can polish it up, and make it look twice as good as it otherwise might.

Running it couldn't be easier. Here's a quick two-step guide on that before we start the tutorial proper. Pick a file you want to play. Drag it onto the viewer. However, while playing the video, you don't have to stick with the default settings – read on to find out how best to configure your playback. **PCF**



**1** First, we need to know what the various options do. With a video loaded – any will do, Neuview uses your installed codecs – click on the **Menu** button to overlay the image with a whole set of buttons. These let you control the quality of your video directly, but for now, click on the **Demo** button.



**2** In this mode, you can test out all of the application's main tools on an individual frame, and see exactly what can be achieved with each one. These are just one-click demonstrations – 1 uses PixelFusion to sharpen up the image, 2 makes the video's colours more vibrant, and 3 polishes up the lighting.



**3** Back in the main window, it's just as easy to apply an effect. Presets offer three standard filter combinations, respectively focusing on detail, naturalism, and dynamic quality, plus there are three configurable user presets. Flick between them on a standard frame and you'll be able to see the difference immediately.



**4** The **Settings** menu offers rather more specific controls, letting you customise brightness, contrast, noise reduction (**Digital NR** in the interface) and sharpness on a movie by movie basis. In most cases, you'll want to stick with the presets though, because at least then you can get on with watching the movie.



## Upgrade

This is a complete version of Neuview, but for more great products like it, you should point your web browser at the web address below, where you'll find more handy applications that will improve your time online.

[www.qolabs.com](http://www.qolabs.com)

## ON THE DISC

### Neuview

Playback your movies with a splash of extra post-processing effects. Put the life back into dull colours, sharpen up the smudges, and return the vitality stolen by poor compression.

[www.qolabs.com](http://www.qolabs.com)

### ArtRage

When you're done touching up your video, try something a bit more creative on a canvas with ArtRage, the high-powered natural painting tool.

[www.ambientdesign.com](http://www.ambientdesign.com)

### CinePaint

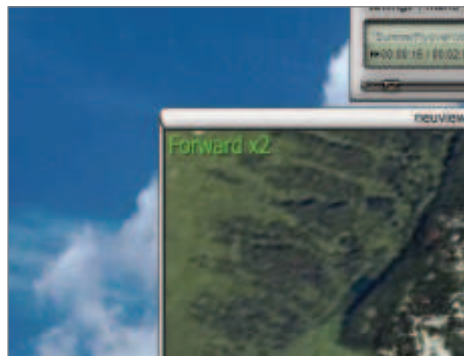
One for Linux users. Make your video the best it can be before anyone actually sees it, as The GIMP takes its editing skills to 24FPS.

[www.cinepaint.org](http://www.cinepaint.org)

### DivX player

Not so much the player itself as the codec – install it and you'll be able to enjoy the best of the web from within your copy of Neuview.

[www.divx.com](http://www.divx.com)



**5** Neuview does more than just post-processing, however. While watching a video, tap the backwards and forwards buttons and you can control the speed of playback – including sending it into reverse, if you like. You can also point it to a stream and watch a movie even as it's downloading.



**6** And here's one very useful feature if you're into movies from foreign parts – when opening up a video, you can specify two 'additional' files, covering subtitles and alternate dub-tracks. Perfect for that latest Japanese anime import, or simply to give a bad film the *Mystery Science Theatre* treatment.

# Speed up Windows


Henry Tucker **knocks his system into shape with PC Optimizer 6**

**A**re you struggling with a recalcitrant, sluggish PC? You don't have to put up with this state of affairs, you know – there's a lot you can do to get it in peak condition. This month on our DVD we've got a full version of ASMW's *PC Optimizer 6.1*. It's packed with tools to help you sort your PC out once and for all – no more staring at that cursed egg timer for hours on end.

Take a look around the app and you're bound to find something that will drag your PC back up to full speed. There are tweaks for XP and Windows 9x, if you're still using it, and there are optimisations for your net connection, your PC's memory and its startup processes.

Once your PC has been restored to tip-top condition, *PC Optimizer* has lots of other useful features, such as file encryption tools, disk checkers and procedures that will help you tidy up your *Outlook* contacts, too.

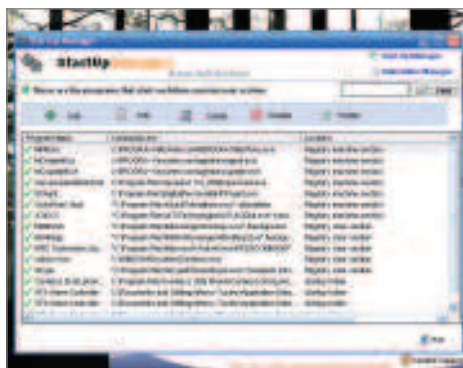
In order to get the best from *PC Optimizer* though you do need to register it. This is free – simply point your browser to [www.asmwsoft.com/freesmw14.htm](http://www.asmwsoft.com/freesmw14.htm) and you'll receive your licence code via email. **PCF**



**Upgrade**

If you like the improvements in performance you invoked with **PC Optimizer 6.1**, you should check out the very latest release, **7.7**. It now has over 30 tools, so you can do even more with your PC.

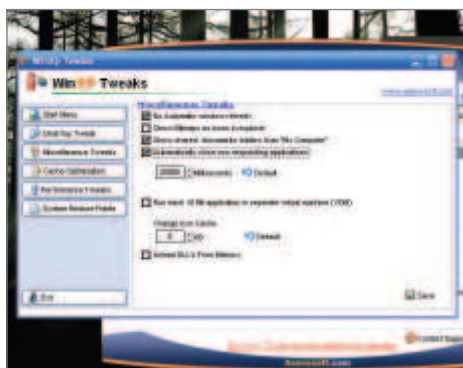
[tinyurl.com/oqe54](http://tinyurl.com/oqe54)



**1** One of the most common complaints PCs suffer from is slow startup. This is caused by a large number of irrelevant processes running when your machine boots. With *StartUp Manager* running though, you can easily enable and disable the items you do and don't need.



**2** Next up, let's tweak your net connection. If you think your web browsing could do with a shot in the arm, click on the **Speed Internet Connection** button. This has settings for broadband and dial-up users and to get you started there's a handy wizard.



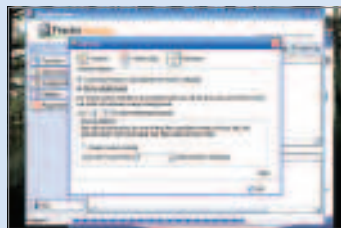
**3** One of the problems with Windows XP is that all PCs end up looking the same after a while, so why not break the mould? Click on the **Tweak Windows XP** icon to access to a wide range of changes, applicable to your desktop background, start menu or system performance.



**4** Finally, open the *RAM Optimizer*, and you can see exactly how much memory your system is currently using and therefore how much is free. This feature can come in very handy, as it lets you know which of your applications are unrepentant memory-hoggers.

## Paranoid? You should be

How to stop people spying on you



**1** If you're keen on keeping your precious PC away from prying eyes while you're online, you can use *PC Optimizer* to cover your tracks. The seriously paranoid will no doubt be happy to read that you can even set the application to run constantly in the background, so you can erase as you go.



**2** Every so often, we all get the urge to permanently delete a file, and *PC Optimizer*'s Shredder tool lets you do this in a few clicks. Find the file or folders you no longer need, ascribe a suitable security level to the file in question, and then amount of times you want to overwrite the file.



**3** The previous steps concern deleting data, but there are also tools here that will keep your files safe. All you have to do is select the right files, set a password and you're done. For added security, you can even set the software to delete the original file as well for that extra level of security.



**4** With all of these processes in place your PC should run like a dream. Complete the spring clean by using *PC Optimizer* to detect any empty folders that may be lurking on your PC. Set it to scan and you'll see all the unnecessary folders, so all you have to do is delete the ones you don't want.



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**Luis Villazon**  
KNOW-ALL

# Ask Luis...

ALL YOUR PC QUESTIONS ANSWERED

## Pub Quiz

Ice in your trivia questions, guv?



- 1 **What is the term for half a byte?**  
a) nybble  
b) semi-byte  
c) demibyte  
d) a byte cannot be subdivided
- 2 **Who owns the trademark "ethernet"?**  
a) 3com  
b) IBM  
c) Xerox  
d) HP
- 3 **In what year did the Microsoft corporation make its first million dollars?**  
a) 1978  
b) 1982  
c) 1986  
d) 1990
- 4 **How much manpower did it take to create the production version of the Intel 8086 CPU?**  
a) Two engineers, three weeks  
b) 12 engineers, two months  
c) 12 engineers, 12 months  
d) 28 engineers, two years
- 5 **Which Safe Mode option do you want if you need to list all loaded drivers?**  
a) Safe Mode  
b) Enable Boot Logging  
c) Safe Mode with Networking  
d) Debugging Mode

Answers on page 131

## Free technical support

Got a problem with your PC? Write to Luis, or better still drop him an email. Assuming you can get your PC to work, that is...

pcfhelpline@futurenet.co.uk  
PCF Helpline  
30 Monmouth Street  
Bath, BA1 2BW

## Help is at hand

Younger than the mountains/ Older than the trees/ Luis Villazon is grumpy/ He answers questions on PCs

Net connection issues seem to be common problem this month.



this any other time I'm online, and I'm a bit stumped.

**STEVEN JOHNSTON**  
stjohn19@tiscali.co.uk

### NETWORKING

#### Cross-platform sharing

**Q** I am about to move house and am unable to transfer my Blueyonder services to the new address so have arranged to have Bulldog Broadband installed. My new housemate wishes to share the connection, but he has an iMac. Is it possible for a PC and iMac to use the same broadband connection?

**DAVID BAKER**  
evo5dave@hotmail.com

**A** My advice is that you don't look for problems where none exist. If you had just plugged the damn thing in and tried it, your housemate would be blithely playing WoW now instead of grinding his teeth in frustration while you wait for a reply to your feeble plea.

The internet is full of routers – in fact, you could say that the internet

is made of routers. Your housemate's iMac successfully negotiates dozens of these trivial hurdles every time he connects to a web site. Adding another one in your living room won't make any difference. It's all still just TCP/IP flying around and this is a language common to virtually every computer on the planet. If this iMac is one of the ancient G3 series and is still running OS9, you might have some problems getting it to cooperate on your LAN but I certainly don't want to hear about it *here*. Write to my non-evil twin who presides over the anti-matter version of this column at *MacFormat*. If the iMac is a G4 running OS X, you won't need to. It will just work.

### SECURITY

#### Lie down with dogs...

**Q** Why does my computer keep crashing on a filesharing website? Has it contracted some kind of dodgy virus, or something? It doesn't do

**A** Let me tell you a story about filesharing websites. I'm in the middle of a six-week, self-imposed leave of absence from *World of Warcraft* in a desperate attempt to get my addiction back under control. Consequently, I am left with a big hole in my schedule a couple of times a week. It's worst late at night when I am too tired to work or do anything creative and all I want to do is play computer games. Except that the only computer game I actually like these days is *World of Warcraft*, which I'm not letting myself play.

So anyway, last week I was in just such a slough of depression and I hit on the notion that *Warcraft III: The Frozen Throne* might be Azerrothian enough to satisfy me without actually counting as cheating. Except that I don't actually own a copy. Amazon could get me a copy next-day but I wanted to be playing within the hour – I needed



some kind of direct download purchasing option. Direct2drive.com didn't have it but googling for "WC3 download" turned up [www.unlimitedgamedownloads.com](http://www.unlimitedgamedownloads.com).

"Download The Entire Game And Many Others, An Amazing Exclusive Offer," it boasted. All those capital letters should have been sufficient to set off my alarms; normally would have been. But I was tired and impatient. Worse, by the time I realised that I had actually signed up to a peer-to-peer file sharing network and my "entire game" was a cracked copy streaming from a variety of basements and bedrooms from Korea to Cologne, I didn't really care. "I'll just play this version for tonight and order a legit copy from Amazon tomorrow," I thought.

As a piece of Jesuitical rationalisation it was fine, but as a strategy for achieving instant gaming satisfaction it failed utterly. Not only did I never get the game to actually start but I also managed to infect my PC with three different viruses and a surprisingly resilient Trojan. This experience has only served to reinforce my view that peer-to-peer networks make about as much sense as scavenging your dinner out of litter bins. In other words, don't come crying to me when you contract botulism or stab your finger on an infected needle.

## FLASH MEMORY

### Document won't save

**Q** I'm trying to save an important work document on my laptop but Microsoft Word keeps telling me that my disk is "full, write protected or damaged". It's definitely not full, I don't think it's write protected,

does that mean it's damaged? How could I have damaged it?

LINDY VILLAZON  
(via phone)

**A** And this, dear Reader, is why I don't do telephone tech support any more. If I am co-opted by a friend or neighbour while I am round for dinner, I can sit in front of the actual machine, see the error message with my own eyes and tinker in complex and hard-to-describe ways. If I receive an email, I have the luxury of choosing whether to respond or cast it aside with ne'er a backward glance. But on the phone, I can neither see what is going on, nor ignore the desperate entreaty. Particularly if the person calling is, in fact, my wife.

The first thing to realise with Word error messages is that they are nearly always wrong. Particularly when they relate to the filing system. Word has no idea whether your disk is full or write protected and it just can't be bothered to find out. All it knows is that it tried to save your file and Windows returned a generic failure code. All the rest is pure guesswork. If you had been trying to save the document to your hard disk then "full, write-protected or damaged" might be reasonable guesses. But you're not. And Word knows you're not because you are saving to drive E, not C. Drive E is almost never a hard disk. In fact, on your machine, drive E is the USB key. And so on this occasion, a more accurate error message would be "Workstuff.doc because your USB key is currently unplugged and on the other side of your desk. Please plug it back in and stop interrupting your

husband who is trying to get some work done."

## PSUS

### Boot failure

**Q** I am having a problem with my PC, and I was wondering if I could count on your help with it. Whenever I turn the machine on, it tries to boot up, but nothing happens, after a few seconds it switches itself off. I have made sure that the CPU fan is working. The PC is only two years old; the screen is not displaying anything at this time; the computer seems to just keep rebooting time and time again until I unplug it at the mains. Is the processor hammered, or could it be a simple power supply issue or even a switch-related problem?

JOHN P DEVINE  
[john.p.devine@seagate.com](mailto:john.p.devine@seagate.com)


**A** It's definitely not the CPU but unfortunately it's not as simple as a stuck front-panel switch either. If the power switch was stuck, your PC would begin booting normally, then after exactly five seconds it would power off and stay off. If the reset button was stuck, the PC would never start, but it would be locked in perpetual reset state. I can think of two scenarios consistent with your symptoms. The first is that the motherboard is somehow generating periodic reset signals, possibly as a result of a dry solder joint somewhere. The other is that the power supply itself is cycling. If you hear the main PSU fan begin to spin down as the PC restarts then you should replace the PSU. If it apparently spins at constant speed throughout the cycling process, then I would start by replacing the motherboard. Either way, I'm afraid you're spending some money.

## APPLICATION GLITCHES

### Stubborn email

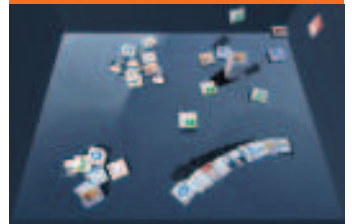
**Q** How do I remove an email message which is permanently stuck in my inbox? It's been there for ages, and I'm having trouble shifting it.

MAIR PACKER  
[mair@draenan.freemove.co.uk](mailto:mair@draenan.freemove.co.uk)

**A** I'm assuming that you are talking about POP3 mail that gets downloaded to your computer using an email client such as Outlook Express or similar, 

# FAQ

## Physics-enabled 3D desktop



No it's not a texture rendering algorithm; it's the future.

### What is it then?

BumpTop is a prototype GUI that uses a physics engine to give your files some of the properties of real objects.

### What properties?

Mass, inertia and thickness.

### What's the point?

Instead of icons that snap rigidly to a grid, they resemble SD cards that can be strewn around the desktop. You can drag one icon into a pile of others and it will knock them out of the way. Or you can stack them up, fold down a corner, stand them on their edge, and so on.

### Isn't that really fiddly?

BumpTop features a new set of mouse gestures to control it. Drag and drop still, works but you can also 'flick' files across the desk. They will collide into any existing files or add themselves to a stack of files. If you lasso a group of files, an icon will appear in the middle of the group. Run the cursor through it, and the group will stack. You can also mouse over stacks to expand the stack in various ways – as a concertina, for example.

### Who is this aimed at?

Non-geeks used to working with real paper that have PCs with very powerful 3D cards. The interface also lends itself well to pen input, – could this be the Tablet PC's killer app?

See a video of BumpTop in action at [honeybrown.ca/pubs/BumpTop.html](http://honeybrown.ca/pubs/BumpTop.html)

## Bedside table

This month, Luis is reading...

### The Business of Software

Authors Eric Sink Publisher Apress Price £18  
ISBN 1-59059-623-4

Publishing a collection of articles that first appeared online on MSDN as a softback book is a good idea. Publishing the articles verbatim, including the lengthy quoted passages that recap the text you have just read in the previous chapter, is not. Nor is the decision to translate all hyperlinks to footnotes or leave the emoticons in. Still, this is an entertaining speed-read on the business side of being a geek entrepreneur – if you fit the narrow target audience, you never know, it might even turn out to be useful.



❏ (for IMAP or web mail, talk to the mail server admin). Stuck emails in Outlook Express are nearly always caused by corrupted database files. You may have some luck if you create a simple mail filtering rule that says "Where the subject line contains <insert subject line here>, delete it" and click **Apply Now**. Or you could try **Tools→Options→Maintenance→Clean up now...→Delete**. But if neither of these work, you will need to delete the database files themselves. Click on **Tools→Options→Maintenance→Store folder...** and copy the file path to the clipboard. Then Close OE, open Explorer and paste this into the address bar. This will take you to the folder that holds the dbx files; there will be one for each top-level mail folder you have. Delete **Inbox.dbx** and restart Outlook Express. A new,

blank Inbox.dbx will be created automatically.

## DISK DRIVES Missing DVD

**Q** I have lost the ability to access my DVD+/-RW off my Dell computer, and, obviously, I need to get it working again. How can I can get it back?

LYNNE HARRIS  
michael.harris557@ntlworld.com

**A** Restart your PC and press whatever button it suggests to take you to the BIOS screen (it's usually the **[Delete]** key). Have a look at the section that lists the drives installed. If the DVD drive doesn't appear there then it is either dead or disconnected. Shut down,

remove the lid, unplug and replug the cable and try again. If it still fails, try swapping cables with another drive and see if the problem stays with the drive or follows the cable. If the latter, replace the cable; if the former, the drive.

If the drive appears in the BIOS but not in **My Computer**, try opening **Control Panel→System** (it's under **Performance and Maintenance** if you use category view). Click the **Hardware** tab then Device Manager and then click the **[+]** sign next to **Disk Drives** to expand the list. If your DVD drive appears there, try deleting it and rebooting. If it doesn't, shut down, open up the PC, disconnect the drive, reboot, shut down again, reconnect the drive and reboot your system again. If your drive remains a phantom, you'll have to fork out for a replacement unit.

## CPU'S Speed limit

**Q** I was running a system, at 1200 overclockable to 1900, bought a new AMD Sempron Processor 2400+, when

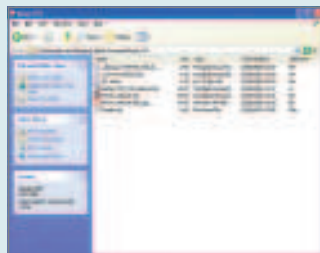
give a higher performance than an Intel clocked at the same speed – maybe equivalent to 1.5GHz or so. In other words, you are roughly back to where you started.

If your motherboard supports an FSB clocked at 333MHz, you can bump it up and get the full 1.67GHz performance, which AMD claim is worth 2.4GHz in Intel's money (though I'd put it nearer 2.2). If it doesn't, you'll need a better motherboard. And if you are changing CPU and motherboard, then you should really be replacing the whole PC.

## EMAIL SCAMS Andy and John!

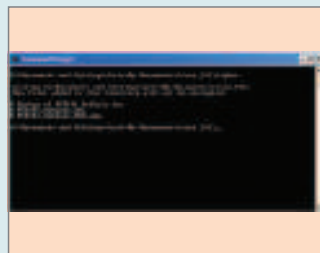
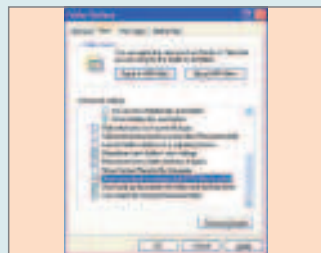
**Q** Hey it is Andy and John the directors of MSN, sorry for the interruption but MSN is closing down. This is because too many inconsiderate people are taking up all the name (eg making up lots of different accounts for just one person), we only have 578 names left. If you would like to close your account, DO NOT SEND THIS MESSAGE ON.

## Finding encrypted files Which files are secret and which are not?



**1 Turning on encryption**  
If you have Windows XP Professional and you are using the NTFS filing system on your disk, you can add security to your documents by encrypting data. **Right-click** your chosen file, choose Properties. Click the **Advanced** button under **Attributes** and tick the box marked **Encrypt contents to secure data..**

**2 Column view**  
Encryption is usually a background process. To find out which files have been encrypted. You can look at the **Properties** page for each one but it's tedious. Instead, switch to **Details** view in **Explorer** and **right-click** the headings to add a column for Attributes. Encrypted files will show an **E** in this column.



**3 Coloured highlights**  
For a more at-a-glance view, click **Tools→Folder Options→View** and tick the box marked **Show encrypted or compressed NTFS files in colour**. This view doesn't distinguish between encrypted and compressed files so if you use XP's built-in compression for all or most of your disk this won't be much help.

**4 Cipher.exe**  
There is a command line tool to spot encrypted files as well. Available from [www.microsoft.com/technet/security/tools/cipher.msp](http://www.microsoft.com/technet/security/tools/cipher.msp). XP users have it built-in. Open the command prompt, navigate to the desired folder using CD and type **cipher**. Files will be listed with an E if they are encrypted and a U if not.

## "Before we start, am I right to assume that you have no idea what you are doing?"

fitted the system shows a 1,000MHz clockable to 1,500, this is no good for what I need, could you explain AMD format for CPUs so I can buy the correct item?

ALEX COULTER  
cac47@btinternet.com

**A** First I'd like you to meet my friend, Mr Full Stop. We use him to stand in between our thoughts so they don't get all bunched up. Commas are not quicker than full stops. Particularly when you factor in the time it takes me upbraid you on your atrocious use of punctuation.

The Sempron 2400 actually has a native clock speed of 1.67GHz, so if yours is running at just 1GHz it is obviously underclocked. Almost certainly this is because of all the mucking about you have done with your previous CPU. The Sempron expects an FSB clocked at 333MHz so the multiplier is fixed at 5 times. If you put it on a Front Side Bus (FSB) running at 200MHz, this will give you a final clockspeed at the CPU of 1,000MHz or 1GHz. Since it's an AMD processor, this will still

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FORWARDED BY IAN VA DER LINDE  
ir\_python@hotmail.com

**A** Bad news Andy and John! I've just created approximately 578 new Hotmail accounts. They have all sent your moronic email to each other, so me and all of my split personalities get to have our nice blue icons and interruption-free MSN usage, and you lucky fellows are smack out of names! How do you like them apples? Eh? Eh? And that, ladies





# Microsoft takes on JPEG

Windows Media Photo boasts high quality pictures in half the size of JPEG, but James Morris wants to know how Microsoft will squash photos so small...

**F**ew things last long when it comes to PC standards. Even the mighty .doc format for letters is on its way out. The JPEG method of photo compression, however, has dominated imaging since its release in 1994, to the point where it's the de facto format for every compact digital camera in the world. It's hard to imagine a world without its efficient algorithms, which changed the web from a slow, text-based medium to the bright visual environment it is today. The more recent JPEG2000 has become the chosen format of the digital movie industry as well.

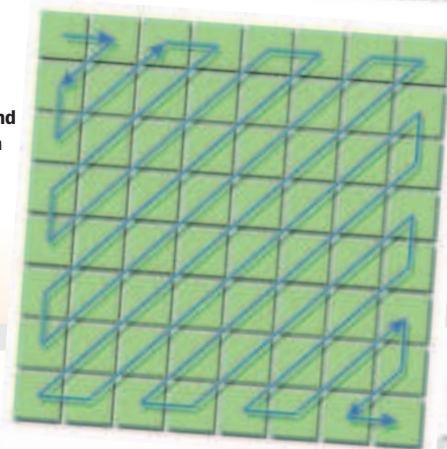
In hindsight, it seems incredible that JPG has had its position as top dog for pictures unchallenged for so long. Enter, stage right, Microsoft: the beast of Redmond is keen for its share of the picture pie, and is launching its own compression technique – Windows Media Photo – which it is pushing alongside Windows Media Audio and Windows Media Video to complete its audio-visual canon.

## HOW YOUR PC UNDERSTANDS IMAGES

Bill Crow demonstrated the upcoming WMP format at the Windows Hardware Engineering Conference in May, and claimed the double whammy of better quality images in smaller files than JPEG can manage. Indeed, comparable images should be half the size. Some details on how this technical jiggery pokery will be achieved have been released, but specific secrets on how it betters JPEG2000 are being held close to the chest – this is no open source project after all. But by taking a look at the way JPEG works, we can make a few educated guesses.

For a full-colour, uncompressed, bitmap image, 24 bits are required per pixel (eight bits for each of the three colour channels). That's why even an image at 640x480 fills a full megabyte of space. The JPEG format is based on a system called Discrete Cosine Transform (DCT). When you save an

Entropy coding reads the end result of the quantisation in a zig-zag pattern.



This is the same image compressed by a factor of 99 using 4:2:0 colour sampling. The loss of detail is so great it looks virtually posterised.





As an uncompressed RGB bitmap, this image would take nearly 7MB. This is a JPEG with 14:1 compression, with little artefacting discernible.

10	0	-2	-1	-1	-1	0	0	-1	EOB
----	---	----	----	----	----	---	---	----	-----

Using Huffman coding, this is all that needs to be stored to represent the entire 64-pixel block. Now *that's* compression...

139	144	149	153	155	155	155	155	DCT →	157	-1	-12	-5	2	-2	-3	1
144	151	153	156	159	156	156	156		-23	-17	-6	-3	-3	0	0	-1
150	155	160	163	158	156	156	156		-11	-9	-2	2	0	-1	-1	0
159	161	162	160	160	159	159	159		-7	-2	0	1	1	0	0	0
159	160	161	162	162	155	155	155		-1	-1	1	2	0	-1	1	1
161	161	161	161	160	157	157	157		2	0	2	0	-1	1	1	-1
162	162	161	163	162	157	157	157		-1	0	0	-1	0	2	1	-1
162	162	161	161	163	158	158	158		-3	2	-4	-2	2	1	-1	0

On the left, the original values for the pixels in the 8x8 JPEG block, but after DCT transformation, the significant frequency numbers are concentrated on the top left.

157	-1	-12	-5	2	-2	-3	1	QUANT. →	10	0	-1	0	0	0	0	0
-23	-17	-6	-3	-3	0	0	-1		-2	-1	0	0	0	0	0	0
-11	-9	-2	2	0	-1	-1	0		-1	-1	0	0	0	0	0	0
-7	-2	0	1	1	0	0	0		0	0	0	0	0	0	0	0
-1	-1	1	2	0	-1	1	1		0	0	0	0	0	0	0	0
2	0	2	0	-1	1	1	-1		0	0	0	0	0	0	0	0
-1	0	0	-1	0	2	1	-1		0	0	0	0	0	0	0	0
-3	2	-4	-2	2	1	-1	0		0	0	0	0	0	0	0	0

The DCT output on the left is quantised according to the compression matrix, which converts most of the smaller numbers to zero.

image as a JPEG, the colour space is converted from the red/green/blue (RGB) values of raw bitmaps to 'YCC'. The Y refers to the brightness of each pixel, and the two Cs to colour differences. However, the three channels can also be sampled at different rates. Most JPEGs use a scheme called 4:2:0, where the brightness is sampled at full rate, but the other two colour channels are half the resolution. This is the first reduction in the image's eventual file size.

Next come the complicated bits – DCT, quantisation and entropy coding. In order to apply these, each channel is turned into tiles of eight by eight pixels. Then DCT is used to convert the values in each tile algorithmically into a matrix of frequency values, with the most significant in the top left. Quantisation is then applied to the DCT matrix. Because variations in high-frequency brightness are hard for the human eye to discern, information in this area can be discarded. The quantisation matrix is used to divide elements by a constant value for each component, and the results rounded to the nearest integer. This removes many of the highest frequency variations, so most of the resulting numerical matrix is now filled with zeroes.

Entropy coding is the final part of the process, where the matrix is arranged in order according to a zig-zag path across elements, starting in the top left. Huffman Run-Length Encoding (RLE) is then applied to the result. This is a system which allows the string of numbers representing each tile to be of variable length. Because many of the higher frequencies are represented as zero, a string of these at the end of the series can be replaced by a single code-word EOB. If 16 zeroes are found but with more values afterwards, they can be replaced with the single code ZRL. Using these two code words, the amount of bits required to describe the image is vastly reduced.

During decompression, the compressed file is converted back to RGB pixels for on-screen display. This follows the above system in reverse, but information cannot be retrieved where values have been reduced to zero. So with high compression, the quantisation system can make adjacent 8x8 tiles vary in colour compared to the original image, so you can see the edges of the tiles clearly – as JPEG blockiness.

Take a look at the format options in your favourite photo editor and you will probably see 10 or more file types available. One of the most important schemes is LZW, which unlike JPEG, is 'lossless'. This option is available with a number of formats, such as TIFF bitmaps, for example. But it isn't capable of reducing file sizes anywhere near as much as JPEG. The new JPEG standard, JPEG2000, uses a completely different scheme called wavelet compression. This is much more scalable, and images degrade gracefully at low bitrates, so don't exhibit the blockiness of JPEGs.

## MICROSOFT'S ROAD AHEAD

One of the aims of Windows Media Photo is to preserve more dynamic range, which JPEG tends to discard at high ratios. Instead of using only the YCC colour space, it can use mono, RGB, CMYK and n-Channel – storing up to eight colours to match photo printers, for example. with up to 16-bit integer or 32-bit floating point sampling per channel. Instead of 8x8 tiles, 16x16 tiles are used, and a biorthogonal transform rather than DCT – similar, we think, to that in JPEG2000.

Just being technically good isn't everything – as Sony's excellent but not widely popular ATRAC music files show.

If there's a licence fee involved too, Windows Media Photo may lose out in the same way

Windows Media Video has to more open MPEG-4 standards. **PCF**

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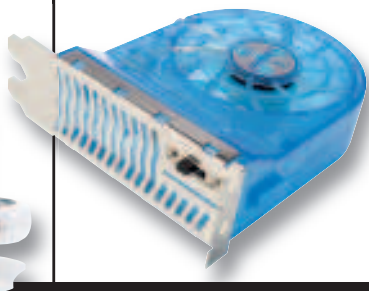
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# Restart

## YESTERDAY'S GAMES TODAY

## Ancient Civilizations

REDISCOVER No theme parks or hospitals here...

**T**his game was an early passion for Games Ed Carey, winning him over to the beige box with its fearsome depth and complexity. The elements that gave it such strength are still convincing. *Civ II*'s utilitarian graphics are no barrier to the meat of the game. In fact, playing this again after *Civ IV*, we actually found ourselves missing the simple 2D life. It's all too easy to get distracted by visuals today, but back then you had an empire to run and that was what mattered. Diplomacy always played a key role, and success always boiled down to one thing: did you

have the megalomaniacal spine to crush an ally when the opportunity arose?

Of course, no appraisal of *Civ II* can go without mentioning the Throne Room. When you'd done sufficiently well to please your people, the rewards were delivered in glorious 3D. Dressing up your cave in furs, velvet, bones and finally gilt as your reign progressed was a joyous perk. They don't make 'em like this any more...

You'll have trouble finding *Civ II* in mint condition, but why not try *C-Evo* ([www.c-evo.org](http://www.c-evo.org)) or *FreeCiv* ([www.freeciv.org](http://www.freeciv.org))? Both are able clones.



We found this *Civ II* in a drawer. The tech tree had never been opened, it's that mint...

### FALSE PROPHETS

"THE ESSENTIAL PC ACCESSORY FOR 1994 IS GEPRO'S COMPUTER OPTICS. THESE AVIATOR-STYLE SPECS ABSORB THE HARMFUL RAYS FROM YOUR MONITOR. IN FACT, IF YOU DON'T WEAR THEM YOUR EYES WILL TURN INTO BUBBLING BITS WITHIN MINUTES." WE HOPE WE WERE BEING SARCASTIC IN PCF36.

## Obliteration

**W**e let Tech Ed AI review top-down gore-fest *Invasion Earth* this month, which contains even more 'jam' than the accurately named *Crimsonland* ([crimsonland.reflexive.com](http://crimsonland.reflexive.com)) and he damn near exploded with glee.

Next, PCF's resident bloodhound went in search of this *Alien Breed* clone. It's faithful to the original Amiga version, but packs in 15 levels, and You can even have a crack a level editing. Find the installer on the disc.

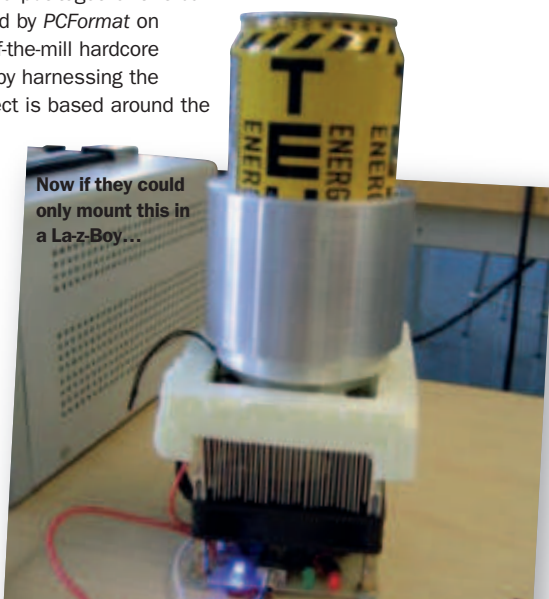


Get more info at  
[homepage.ntlworld.com/xavnet/alienbreed](http://homepage.ntlworld.com/xavnet/alienbreed)

## Canned heat

REINVENT The magic of thermodynamics combine to chill your in-game bevvv

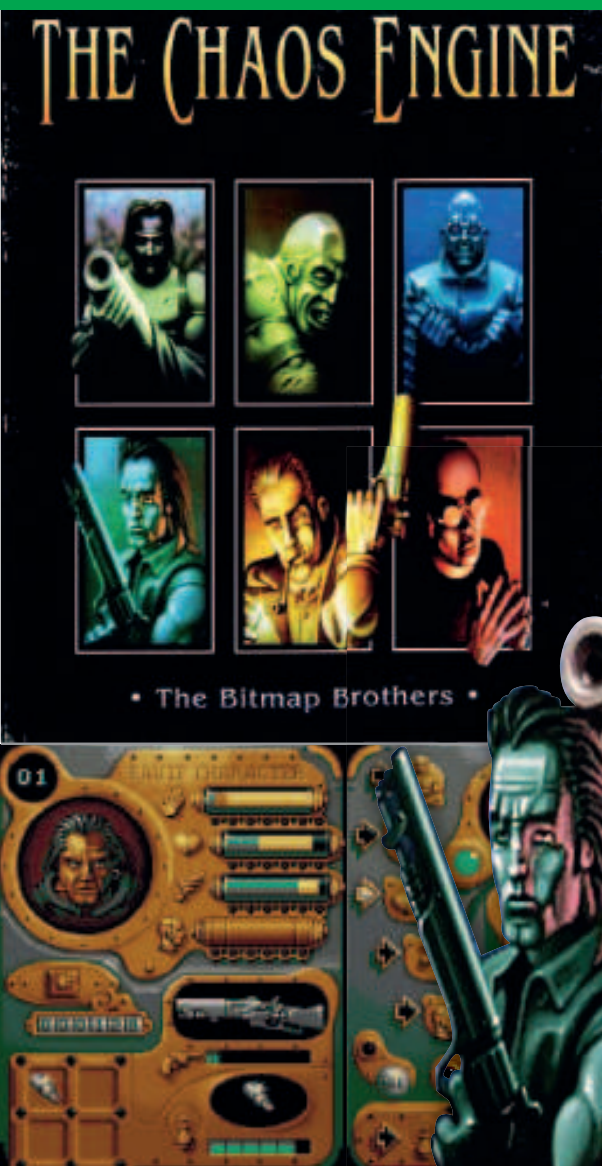
**G**oing one better than our guides to overclocking and cooling (starting over on page 36), Finnish student Valojuova put together this can cooler for a school project. Spotted by PCFormat on [tinyurl.com/h7vvr](http://tinyurl.com/h7vvr), It may look like a run-of-the-mill hardcore heatsink/fan setup, but it actually works by harnessing the Peltier effect of thermodynamics. The effect is based around the direct conversion of heat into electricity between certain metals. Different metals have slightly different ambient temperatures, and a current that's generated between them can then cool the lovely liquid contained within the precision-machined aluminium holder. The really neat thing is that this small 12V, 80W Peltier cooler can zap the temperature of the can down dramatically in a very short period of time, so now you can now throw away your beer fridge, as any old warm can from the cupboard will now suffice.





SACRIFICE HAD MORE OF A DIFFICULTY WALL THAN A DIFFICULTY CURVE, BUT AFTER A WHILE, YOU UNDERSTAND THE GAME, AND IT SORT OF CLICKS"

Eric Flannum, Lead Designer, Shiny Entertainment



SEPTEMBER  
1993

GAME  
THE CHAOS ENGINE

SCORE  
PCF 36, 78%

## REMEMBER...

Babbage dreamed of beautiful calculating machines. If he'd had a nightmare, it would have been called *The Chaos Engine*

**C**all us old-fashioned, but for our money steampunk is by far the best kind of punk there is. Think about it. Cyberpunk? So Eighties. GolfPunk? Too yuppie for us. Steam? Steam's where it's at, definitely.

The Bitmap Brothers' top-down shoot-'em-up wasn't on a par with contemporaries like *Syndicate*, but it had a setting and characters beyond reproach. Mutant Victorian technofetishists, sinister priests, a character called Navvie who was... wait for it... a navvie. What's not to like?

Four worlds with four levels in each is a pretty stingy crop though, even by 1993's standards. However, for two-player co-op shooting with a chum it was quite literally a blast. There was a pleasant balance of exploding heads and puzzle solving, coupled with fairly decent RPG elements too (each of the six excellent characters had different skills and abilities). It wasn't the best thing to come from the Bitmaps, but it won a place in many hearts, including ours.

## ALSO OUT THEN...



### TIE FIGHTER

To many, this is the zenith of the *X-Wing* trilogy. This second title in the series leaves the rebels on the run. You'll spend most of it gloating from a Super Star Destroyer with the Emperor while Darth gets on with his moral crisis, but there was no doubting whose side you were on.

SCORE  
PCF 92%



### WING COMMANDER ARMADA

In stark contrast to *Tie Fighter*, the *Wing Commander* series was on its last legs here. If you had a 50MHz 486DX you could play the system-hungry two-player split screen mode. It lacked the depth of *UFO*, though, and didn't really take off.

SCORE  
PCF 69%



### SOCCER KID

Platform games used to be a staple of the PC diet. *Prince of Persia* and *Zool* had their gimmicky hooks, but Soccer Kid, he had a football. The keepy-uppy king was a sociopath, mind you. Today, he'd be given an ASBO before the end of the first level, you mark our words.

SCORE  
PCF 82%



# Looking Back

## THE CREATORS' CRITIQUE



### Fact File Happy people

**Subject** Eric Flannum  
**Job title** Lead Designer  
**Developer**  
Shiny Entertainment  
**Reviewed** PCF116, 88%



The unflinchingly close perspective makes *Sacrifice*'s frequent battles particularly intense. Just the way we like them...



The Dark Cloud signified an altar being desecrated. If it's yours, it's probably game over.

# Sacrifice

Kieron Gillen **buffs up his interviewing skills before tackling the creative minds behind this eccentric little action adventure**

**T**his is one of the most distant landmarks in the PC gaming atlas, in an area marked "here be dragons." While spectacular, few people went there, and those who did came back reciting fantastical tales of strange vistas, genre-blending mechanics and a wicked sense of humour. To game historians, it'll prove as mystifying as Stonehenge.

Well, like everything, it started with an idea. "The inspiration was originally from our lead programmer, Martin Brownlow," Eric Flannum, now at Arenanet, tells *PCFormat*. "He got the opportunity to start a team at Shiny, and was able to make any game he wanted to. He'd also had the idea for the *Sacrifice* terrain engine." The

game he wanted to make was, essentially, a radical update of ancient Julian Gollop spectrum classic *Chaos*, but in 3D.

### CHAOS THEORY

Brownlow spent time gathering his team. Flannum was approached via a mutual contact who he'd worked with at Blizzard. "I was looking for work at the time, and he called me. 'We need a designer, and we've got this really cool engine and the basis of the game... but we could really use some help with refining it.' Everything worked out from there." Bar his need for money, what attracted him to that decision? "The team was *really good*," Flannum effuses. "Secondly, the striking look the game had. When you first saw it, especially at the time, it was unique. I'd always had a love for RTS and action games, and trying to combine the two was certainly a challenge and very intriguing."

With the game underway, when Flannum arrived they had two priorities. "The singleplayer campaign and marking out the units and what they did needed clarification," he explains. "We had the idea that we wanted the campaign to be freeform, so coming up with a structure was tricky. We had to work out how the story would progress, since the player could take any God's mission they wanted. Then

we had to look at the unit balance, as players could mix and match different tiers. How could we make that work, exactly?"

But the some of the hardest decisions were made around refining the game mechanics. "It had a *lot* of features," Flannum remembers. "You originally had more than one wizard and you could swap between them or inhabit any unit and control it, like in *Dungeon Keeper 2*. You also had the ability to open three more gameplay windows centred on any unit, so you could have four points of view." Sounds awesome. Why lose it? "One of the things we found was that while they were really cool features, they tended to make the game more complicated, muddled the interface and detracted from the main thing we were trying to get at – being a general on the battlefield," he explains. "It's always hard when you spend time implementing something to then take it out, so they were tough decisions."

### BLEND THOSE GENRES

Flannum has no regrets about the decisions, however. "I think they were big wins, as one of the things which stood in the way of *Sacrifice* appealing more was that there were so many different and new things in it. We were asking a lot from the player as far as what they had to accept,"



Gather the red souls to reduce your enemies' power.



# Developer Diary

Vincent van Diemen on why game developers need input from their publishers



## Picture the scene:

I am in a restaurant, meeting the Managing Director of a well-known game development studio, who is pitching a game that has been in development for more

than two years, and still has not been signed with any publisher for a reasonable price. "I will never work on a project where I have to explain exactly what the gameplay is again" he says, while staying almost perfectly calm. Since his investor has become concerned about ever making even a part of his investment back, the MD has decided to pitch the product for an "unreasonably low price." "But..." he continues, "we will not walk into the same trap again. We were foolish, but we've learned our lesson."

Apparently the studio in question was planning new projects already, almost as if it was initially too eager to move forward with this project, which failed in so many ways. Of course, I was interested to find out what this new concept was that he was referring to, the one that had to generate the profit to not only pay back the investor, but to even make him some money. "Our next project will be a futuristic racing-type game with role-playing elements," he announced proudly.

No matter how much they would like to deny it, developers need input, assistance and support, both financial and constructive, from their publishers. Publishers cannot simply sell and market a developer's games, but should also assist in every step of the process where possible. Not many independent developers can come up with an original game concept, design it top to bottom and then get it to market on their own.

Investors must also learn that they, in turn, should invest in publishers. Publishers that are seriously interested in what their developers do should be backed financially, as without the support of third-party investors, truly innovative games would never get published. Investors have to realise that in the games industry, having faith in a talented team will pay off in the long run. Investing in sure-fire winners (sequels, franchises and so on) may be commercially viable, but it doesn't necessarily lead to the kind of bold, innovative design that gamers crave.

Vincent is the Development Director at Most Wanted Entertainment



Thingies fighting what-you-call-its? is a common sight in *Sacrifice*.

he explains. "The visual style, the lack of a disembodied camera... players had a lot of new concepts to wrap themselves around."

These "problems" were also some of the things which distinguished the game. "It was one of the strengths of *Sacrifice* – the wacky visual look." Flannum ruminates: "There's something about 'an archer' which communicates on a very basic level what that unit does. People don't have to learn. But when you've got a little pyromaniac, there's an extra step of learning. They don't know what he does."

## A BYGONE ERA?

When asked if *Sacrifice* was a product of its time, whether something as unusual would be prevented by an accountant's fear of blowing a mega-budget on a curio, Flannum finds another angle: "Even at the time, *Sacrifice* had a very small team at its core," he notes, "we had two programmers who did the majority of the coding. For the longest time we only had one main designer. Four artists, one animator. With team sizes being smaller, each individual has more of a chance to put their stamp on things. In addition to the budgetary concerns that make designing a really eclectic game risky, the smaller team size lent itself to games being more quirky. With bigger teams, it's harder to remain fluid. It's harder to react to a weird idea or something like that, as you have a much bigger ship to steer. With *Sacrifice*, if an artist had a crazy idea, it's easier to just accommodate it"

In terms of its biggest problem, we return yet again to accessibility – and here the small team

was actually a problem. " *Sacrifice* had more of a difficulty wall than a difficulty curve," Flannum says. "We didn't realise this, but there's a point at which you understand the game. It sort of clicks for people. They'll be playing it, and then it's there. The QA guys and the team had been playing it, but it was harder than we realised as we were very familiar with how to play it."

But this problem is really overwhelmed by its strengths. "One of the things I really liked was the sound," Flannum argues, "I thought we did an

exceptional job of it, and it's a neglected part of a lot of games. I think a lot of the time, sound doesn't get the attention it deserves.

Where would they have taken *Sacrifice*

next? "We had some plans we were talking about back when there was the possibility of an expansion – and there have been some games that have tried this, like *SpellForce* – but taking that campaign structure and going a step further," he argues. "We were planning on being even more like an RPG, in that you were literally taking missions as quests from different characters, and treating the ethereal realm as a level in itself. I see more people approaching this from the action – like *The Outfit*, which has introduced a few strategy elements. It would be great to see some more strategy people trying to get that commander-on-the-battlefield feeling." Personally, PCFormat would just like more games with spells called 'Bovine Intervention,' which sent an enormous cow speeding into the air to then crash land on an unfortunate individual. **PCF**

**"With a big team, it's hard to remain fluid, and design an eclectic game"**

## Under the influence

Waving, not drowning

What fans of the game frequently forget about *Sacrifice* is that well before *Black & White*, it implemented a gesture-based mouse movement system for dishing out orders in battle. "One of the greatest strengths that

system had was that for players who couldn't do the whole gesture thing, you didn't have to," Eric notes. "You could treat it as a normal radial menu if you approached it slowly. Go over and up, and that's the one that I want,

while players that were really adept could use mouse-gesture control if they wanted. It would be nice to see someone take up that kind of control system, explore it a little more, and see what we could do with it these days."

# ReFresh

OLD GAMES, NEW LIFE

## The Mod Squad

Keep that gaming fire burning



### MultiTES4: Multiplayer Oblivion

Game Oblivion

Web [csusap.csu.edu.au/~mlocto01](http://csusap.csu.edu.au/~mlocto01)

It's buggier than a Volkswagen convention at the moment, but it's still the closest thing we have to *Oblivion* perfection. All you can do is wander around Cyrodiil with one other person, but it's still an amazing experience. There are plans for eight-player support and some CTF and DM-style quests. For a glimpse of that glorious nirvana, install this mod off our disc and find a patient buddy...



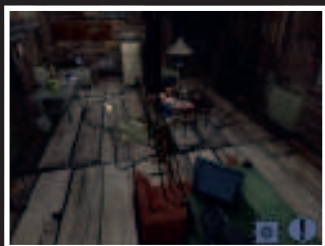
### Weekday Warrior

Game HL2

Web [students.guildhall.smu.edu/~weekdaywarrior](http://students.guildhall.smu.edu/~weekdaywarrior)

Hmm, there's something familiar about this old-style point-and-click adventure in the Source engine... You're a slacker code monkey, getting through the days by looking at web comics and doing as little work as possible. But things take a turn for the surreal when your daydreams become all too real. It's a polished game for a first release, but our hero's legs do look like they're made out of jelly.

## HONOURABLE MENTION



### Shantytown

Game HL2

Web [www.fileplanet.com/half\\_life.shtml](http://www.fileplanet.com/half_life.shtml)

More point-and-click renaissance in the Source engine. The strongest aspect of *Shantytown* is its rich, well-developed setting. The world has been enveloped by an unstoppable fungus, and lack of space has forced mankind to build up rather than out, resulting in cities like towering junkyards. Admittedly, a lot of the models (including lead characters) are ripped straight from *Half-Life 2*, but at least you can't accuse *Shantytown* of being un inventive.



**S**ome 180 accounts were recently wiped from the aging *Ultima Online* MMO in an effort to stomp on the exploiters. Along with the accounts, around 15 trillion units of gold were dumped out of circulation. That's 15 with 12 zeros after it (unless by some madness they were using the long-scale trillion, in which case we're talking 18 zeros). At today's real-world exchange rate, that's over \$20,000,000 or around £10,800,000 sterling. Whichever way you look at, it that's a lot of beans. Allegedly, the accounts were being used as money-laundering fronts. If there's money to be made in those numbers from organised criminal activity, surely protection rackets and mafiosi wiseguy elfmen can't be far away...

In other news, the cross-server Battlegrounds patch is headed for WoW. For the first time, PvP players will be able to do battle with players from other realms in three instanced battlegrounds: Warsong Gulch, Arathi Basin and Alterac Valley. More details about how the realm-vs-realm fighting works (battlegroup matching and so forth) is available on [www.worldofwarcraft.com](http://www.worldofwarcraft.com).



## RE-RELEASES THIS MONTH

Once more unto the breach, dear gamers



Mafia

Sold Out >> £4.99

Work your lowly foot soldier up to the top of the goodfella tree in this stylish GTA-alike. With over 60 vehicles, including authentic Depression-Era vehicles, it has bags of period class.



Conflict: Global Storm

Sold Out >> £9.99

Counter-terrorist, squad-based action in the *Rainbow Six* vein. It lacks the purity of *Counter-Strike* and the depth of *Rainbow*, but its fast, accessible action will appeal to tactical shooters.



Total Overdose

Sold Out >> £9.99

GTA meets *Once upon a Time in Mexico*. It's a pastiche of Rockstar's free-roaming opus, filled with silliness and slapstick violence. The po-faced should avoid this like the proverbial.



Vietcong: Purple Haze

Sold Out >> £9.99

The shooter that never quite hit the mark returns at a budget price. While the singleplayer elements are a tad linear, there's a lot to be said for the jungle fighting in multiplayer mode.



# WIN!

# PRIZES WORTH £1,000

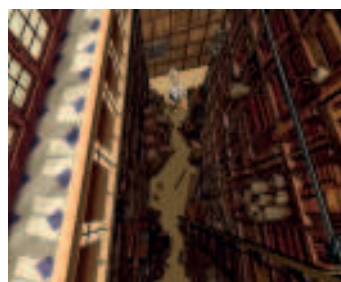


Throw yourself into a beautiful point-and-click adventure with *Runaway 2*.

# Win this Conroe-powered über rig plus five copies of Runaway 2!

It's the first time the series has hit the UK, and we can't wait to play it...

**R**unaway was a huge success in the European and US markets (selling over 600,000 copies in the EU alone) but it never reached UK shores. It's a classic point-and-click adventure, beautifully drawn and



The humorous 2D adventure's been a massive success in Europe.

animated with no attempt to hide its 2D roots. It follows the story of Brian and Gina, a young, disaster-prone couple, and takes in over 100 locations around the world. The strength of the first game was the grown-up attitude and humour. It's got a kind of *Spaced* thing going on, filled with references to movies and TV for those in the know.

To celebrate the arrival of the series to UK audiences with *Runaway 2*, we've got together with publisher Ascaron to bring you five copies of the new game, plus a seriously tasty PC for one lucky winner to run it on. Based around Intel's new Conroe dual-core CPU (the fastest chip you can buy at the moment) with a staggering

1,066MHz FSB. We've also thrown in 1GB of PC6400 Corsair RAM and coupled it with a throbbing GeForce 7950GX2 graphics card. With 1GB of dedicated video DDR3 and 48 pixel pipelines, this dual-GPU SLI setup will tear through any game you care to throw at it with ease.

## PC SPECS

- >> Intel Core Duo E6400 S775, 2.13GHz, 1,066MHz FSB, Conroe Core 2M Cache
- >> 1GB Corsair XMS2, DDR2 OC6400 (800), CAS 5-5-5-12
- >> ASUS ASB-P5B i965 motherboard
- >> 1GB Gainward 7950GX2, PCI-E (x16), 1,200MHz, GPU 500MHz,

48 pipes, HDTV 2 x dual-link DVI-I graphics card

- >> 250GB Maxtor Diamondmax 10, SATA300 7,200 RPM, 16MB cache hard drive
- >> 580W Hiperpower modular PSU
- >> Coolermaster Cavalier 3 case (black)
- >> Dual-layer DVD+RW optical drive

## HOW TO ENTER

Answer the following question for a chance to win this fantastic prize:

**The runaway train came over the hill and she...?**

- A) Blew
- B) Blew up
- C) Was held up by the wrong kind of leaves on the line

Visit [www.pcformat.co.uk](http://www.pcformat.co.uk) for instructions on how to enter.

# WIN!



\* monitor may differ from one shown



# Games rig & Total War Eras up for grabs

## Conquer civilisations across SEGA's incredible *Total War* world with a dual-core dynamite from Dell

**T**o coincide with the release of the multipack-tastic *Total War: Eras* we've teamed up with SEGA and Dell to bring one lucky reader a gaming rig worthy of any desktop. We have a dual-core Dell Dimension 9150 (worth around

£1,000) to give away, but for five runners-up, we've also got copies of said *Total War* collection.

It contains the original *Shogun*, *Medieval* and *Rome*, as well as all the expansions ever released, including the latest, *Alexander* (PCF190, 84%). It's not all about the games though – well, OK, it is, but you don't just get the games. Inside the chunky box is also a book chronicling the art of *Total War*, a DVD interview about the franchise's future, an exclusive peek at *Medieval 2* and all the game music lovingly laid down on CD. In short, it's everything that a *Fan: Total War* could want – plus an awesome PC as well, if you're really, really lucky.

### DELL DIMENSION 9150 SYSTEM SPECS

- >> CPU: Intel Viiv Pentium D 820, 2.8GHz, 2x1MB cache
- >> OS: Windows XP Media Center Edition
- >> Memory: 1GB DDR2 533MHz RAM
- >> Storage: 320GB SATA
- >> Optical drive: 16x DVD+/-RW Drive
- >> 3D card: 256MB NVIDIA GeForce 7900GS
- >> Sound: Integrated Sound Blaster Audigy Advanced HD
- >> Stereo speaker set
- >> Display: 19" Dell E196FP

The gorgeous *Total War: Eras* box set includes a first look at *Medieval 2*.



All this could be yours – if you hand over just £30 at a decent retailer.

### HOW TO ENTER

Well, now you're salivating, all you've got to do to be in with a chance of winning is visit [www.pcformat.co.uk](http://www.pcformat.co.uk), follow the competition link and answer this easy question.

**Who is the developer behind the Total War series?**

- A) The Creative Assembly
- B) The Welsh Assembly
- C) The school assembly



# Next month in **PCFormat**

**GTR2**

Read our review  
online now at  
[www.pcformat.co.uk](http://www.pcformat.co.uk)

## when disaster **strikes!**

**Never say die – how to rescue  
your PC from apocalypse**

**Plus!** The ultimate guide to hard drives; report for duty with  
Company of Heroes; the best tweaks for Vista; more...

## **ON SALE 07-09-2006**



# Overtoyou... HAVE YOUR SAY

## Generation games

PCFormat readers have a diverse range of gaming peccadilloes. This month's survey asked what the first PC game you fell in love with was, and boy, did we get some weird answers...

**5%** of you lost your gaming virginity to Lara in the original Tomb Raider. Just **4%** were introduced to PC gaming by Gordon Freeman. Unchallenged king of the hill at **12%** was Doom, however.

**WHO SAYS SEQUELS** are worse? As many of you started on Civ II as Civ and the same is true for Elite and Frontier: Elite II. **Oddly though, more of you bought Dune 2000 than Dune II.**

**1% of you can't remember your first game. Really?**

A devastating **86%** of you don't know what a Sierra box is. Surely more than **14%** of you remember when games came in cardboard boxes? Out of that, only 20 people still owned their boxes but two of those people had 40 or more Sierra boxes still in their collection. **Get 'em up on eBay, quick.**

**Just over 1/3** of you have bought a new piece of hardware just to play a particular game. **6%** of those did it for Oblivion, another **6%** for Half Life 2 but only **1%** of them upgraded for Doom 3...

**2%** of you claim to upgrade for every new 'killer' or 'blockbuster' game. 2/3 of those upgrades were 3D cards, but a surprising 22% of you have bought an entirely new system to play a specific game.

**29%** of you brave souls have overclocked your PC for gaming purposes, and nearly all of those (**85%**) did it to access either Oblivion, HL2 or F.E.A.R.'s high-detail settings.

**62%** of you have completed Deus Ex, **83%** of you have

finished the original Half Life but only **5%** have played Baldur's Gate II through to completion.

To end where we began, **61%** of you carry a torch for Lara Croft but only **9%** think that HL2's Alyx is all that and a bag of microchips.

**Some of you (who are lucky this is an anonymous poll) have crushes on both Gordon Freeman and Elexis Sinclair**

Stats are not based on anything like as scientific as a random sample.

## WIN!

Sign up to our newsletter at [www.pcformat.co.uk](http://www.pcformat.co.uk) and you'll receive our Over to You survey every month. Bung us your answers for a

chance to win a top-of-the-range Shuttle XPC SN25P barebones system. It supports Athlon 64, HyperTransport, and PCI Express.



Do you have a gaming past more chequered than Rupert the Bear's trousers? Email [pcfmail@pcformat.co.uk](mailto:pcfmail@pcformat.co.uk) and confess all.

**NEXT MONTH**  
PCFormat issue 192 is on sale 7th September